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INSTITUTE of URBAN STUDIES
UNIVERSITY of WINNIPEG

ETHICAL DIMENSIONS OF SUSTAINABLE DEVELOPMENT AND URBANIZATION: SEMINAR PAPERS

Mary Ann Beavis, editor

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Mary Ann Beavis

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INTRODUCTION

Since the beginnings of Western philosophy in ancient Greece, ethics has been concerned with how best to carry on relations between human beings. In the past twenty years, due to mounting concerns about environmental degradation, the scope of ethics has been extended to cover human responsibility with respect to the environment--or what Czech philosopher Erazim Kohak vividly calls "the life world" (CBC, 1990, p. 29). Increasingly, philosophers, environmentalists and policymakers are acknowledging that non-human nature must be preserved, not only because this is necessary for human survival ("future generations"), but also because the environment may even have value in itself (!). As the report of the Brundtland Commission timidly puts it: "the public puts a value on nature that is beyond the normal economic imperatives" (WCED, 1987, p. 165).

The concept of "sustainable development," popularized by the release of the Brundtland Commission report, involves the notion of economic growth that not only does not undermine the environment, but even enhances it (*environmentally* sustainable *economic* development). It implies that value lies not only in economic prosperity, but in the human health, safety and aesthetic appreciation that life in harmony with nature offers. Sustainable development, then, is an ethical notion, in that it is concerned with human and environmental good.

Since 1987, the idea of sustainable development has undergone much discussion, elaboration and critique. One issue that, until very recently, had received very little attention is the question of the place of urbanization in sustainable development, and the related question of what is a sustainable city.[1] Since, as the Brundtland report acknowledged, the world is becoming increasingly urbanized,[2] it is essential that cities be regarded as an intrinsic part of the life world, subject to development which can either sustain or degrade human and environmental well-being. As Robert Paehlke has pointed out, there are some ways in which cities may be ecologically preferable to smaller settlements, e.g., more efficient energy use, amenability to public transportation, ease of recycling and hazardous waste treatment, and wilderness preservation (Paehlke, 1986, pp. 6-11). Paehlke's ideas are reminiscent of theologian Jacques Ellul's observation that God gave humanity "a particular and limited bit of nature--not all of nature" (1970, p. 173). The ideal city (the "New Jerusalem"), for Ellul, "is a limited place made for man [*sic*], and nature goes back to its relatively autonomous state" (p. 191). Ellul's vision of the eschatological city as a "limited place for humanity" may have some relevance for sustainable urban development; we must learn how to manage our own preferred human habitats before we take on the task of "stewarding" the whole of nature!

Towards this end, an interdisciplinary seminar entitled "Sustainable Development and Urbanization: Ethical Dimensions," funded by the Social Sciences and Humanities Research Council of Canada and sponsored by the Institute of Urban Studies, met once a month at the University of Winnipeg from October

1989 to April 1990. Papers were contributed by academics from such diverse fields as geography, philosophy, urban and rural planning, sociology and political studies. Participants included academics, government officials, planners, students and other interested members of the public. The seminar papers collected here touch on various aspects of sustainable development, urbanization and related ethical issues. Susan Wismer's contribution defines the principles, goals and requirements of sustainable urban development. Brij Mathur applies the concept of sustainable development to a local case of under-utilized urban infrastructure in a Winnipeg school division. Peter Miller philosophically and pragmatically examines an aspect of urban policy that is intrinsic to the notion of the sustainable city: recycling policy. Another vital component of urban sustainability, river water quality, is discussed in a paper by Andy Lockery. Phil Wichern discusses the attitude to sustainable urban development among various policymakers in the City of Winnipeg. The relationship between information technology, primarily located in cities, and the increase in paper use, which has important environmental and social impacts on non-urban areas, is examined by Joel Novek and Karen Kampen.* Finally, John Everitt, Robert Annis and Fred McGuinness explore the question whether city-dwellers have a responsibility to foster sustainable rural communities.

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*Due to time limitations, the paper "Hard Copies, Hard Choices: Paper Pollution in the Information Society" was not presented to the seminar.

NOTES

1. The Brundtland Commission report does contain a chapter entitled "The Urban Challenge," which optimistically maintains that only Third World cities need to be "rethought" in terms of sustainable development, since cities in the industrial world often have the resources to reverse social and environmental decline (WCED, pp. 241-43). Some recent publications which address the issue of how to make cities environmentally and economically sustainable are: David Gordon, ed., *Green Cities: Ecologically Sound Approaches to Urban Space* (Montreal/New York: Black Rose Books, 1990) and *City Magazine: Green Cities*, 10:5 (1989). In June 1990, an international colloquium on "Human Settlements and Sustainable Development" was held at the University of Toronto, and in January 1991, the theme of the Winter Cities Forum (Sault Ste. Marie, Ontario) will be "Sustainable Development for Winter Cities."

2. By the year 2000, half of the Earth's population will live in urban centres. Already, 75% of North Americans live in cities.

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ASSESSING SUSTAINABLE DEVELOPMENT IN AN URBAN CONTEXT

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INTRODUCTION

The idea of "Sustainable Development" has been with us since 1972, when, at the first UN Conference on the Human Environment, Indira Ghandi announced to a largely uncomprehending audience that "poverty is the worst form of pollution." Up until the mid-1980s, however, most of the attention was focused on so-called developing countries, or less frequently, the more disadvantaged rural regions of industrialized countries. In 1987, the publication of the Brundtland Commission's report, *Our Common Future*, served notice to all industrial countries that sustainable development was not just a suitable pursuit for the peripheries. It is no less important to urban centres in industrial countries.[1]

Canadian interest in the Brundtland Commission's work has been strong. The National Task Force on Environment and Economy has resulted in the establishment of the provincial and territorial Round Tables, and, as well, a series of federally and provincially sponsored initiatives, such as the Sustainable Development Unit and the federally-sponsored Institute for Sustainable Development in Manitoba. But people who have turned to the Brundtland Report for guidance regarding how to apply the concepts of sustainable development locally, in an urban setting in a country like Canada, have found relatively little food for thought.

This paper describes some of the findings of a research project which has investigated the potential for implementation of sustainable development in Canada, in urban, rural and Northern settings. Although the focus of the research has been on Canada, our search for ideas and expertise has taken us to other countries as well, in Scandinavia, Great Britain and Europe. What we have found is that, while questions about just what sustainable development is are becoming fewer and fewer, questions about *how* to do it are still very much on everyone's mind, and questions about how to understand, analyze and evaluate sustainable development are only beginning to be asked.

The paper has two parts: the first part provides a brief overview of the perspective on sustainable development generated through our research; the second part offers some thoughts on the implications of that perspective for a framework for analysis of sustainable development.

A PERSPECTIVE ON SUSTAINABLE DEVELOPMENT

SUSTAINABLE DEVELOPMENT DEFINED

In the context of sustainability, development is best understood as a social process which has environmental and economic impacts. The definition of sustainable development used here is similar to that of the Brundtland Commission:

> Sustainable development is a community-based process directed toward achieving optimum states of human and environmental well-being without compromising the possibilities for other people, at other times and places to do the same.

Sustainable development is one member of a family of "other development" strategies. Sustainable development is an integrated approach, including social, environmental, cultural and spiritual well-being as well as economic progress in its scope of activity.

THREE CENTRAL THEMES

Our research has convinced us that the practice of sustainable development in Canada must incorporate three central themes: community, equity and the integration of environment/economy relationships. A focus on any one, or two, of these themes is not sufficient, since each does not necessarily imply the other.

The first theme is *Community*. The essence of any development--sustainable or not--is not in programs or policies or even institutions, although all of these are necessary. It is in the lives of ordinary people working together for some common goal. Without on-the-ground activities, there can be no development. Although policies, programs and institutions provide an essential supporting framework for sustainable development, it is what goes on within that framework that determines whether development takes place, and with what effect. Ultimately, it is what people *do* that counts. And, although individual action is critical, development is about people in groups--in families, in neighbourhoods, in communities. One implication of this first theme is that evaluation must start and end at the community level.

The second central theme is *Equity*. In 1972, when Indira Ghandi asserted that poverty is the worst form of pollution, hardly anyone understood her. Now, there is plenty of evidence to show that it is people at the economic extremes--the poor and the rich--who are damaging the global environment we all share in the most serious and potentially irreversible ways.[2] Distributional issues are clearly important in sustainable development, not only across generations, in order to ensure that those to come have equal opportunity with those of us who are here now to live a fulfilling and secure life, but also across the lines of race, class, gender and geography that divide people today. Canada is responsible, as one of the world's wealthier countries, for reducing our waste of essential resources. We are also responsible

for doing what we can to make it possible for people in other countries to do the same. Equity, then, is not only a social issue, it is also an economic and an environmental issue.

In much of the discussion about sustainable development, equity concerns have been virtually ignored. This is difficult to condone. Development is always a matter of values and beliefs as well as activities and outcomes. Canada is committed, through our own Charter of Rights and Freedoms, and as a signatory to the United Nations Declaration on Human Rights, to the principle of equitable rights, to security of the person and to the attainment for everyone of a standard of living adequate for individual and family well-being. Currently, in Canada, one in five children is being raised in official poverty, in families without sufficient income to cover all basic needs. Up to 500,000 Canadians are homeless. In a country where an equal distribution of wealth would give each Canadian an annual income of $75,000, these conditions seem unnecessary.[3] Equity is not just a socio-economic and an environmental issue. It is also an ethical issue. Equity is at the heart of sustainable development.

The third theme is *Environment/Economy* relationships. It no longer makes sense to have two separate words and two separate ways of thinking about environment and economy. The words "ecology" and "economy" share the same Greek root word meaning "house" (*oikos*). One refers to understanding the house, the other to its ordering, but both refer to the same house. All that we are, all that we have, all that our children will be and have is based on the land, water and air that supports us and on the quality of our relationships with those elements and with the other people and species with which we share our ecosystems. Sustainability requires the development--or redevelopment--of an understanding of connections, not only between environment and economy, but more generally among the elements, other species and other people which are the world around us. Redrawing environment and economy relationships and challenging conventional definitions of both "economy" and "environment" will be critical both to the implementation of sustainable development, and to its evaluation.

A NEW PARADIGM

This is not simply a new approach to development, but a new way of conceptualizing development--a new paradigm. Principally, it is one which recognizes that sustainability lies in those places where the three central themes of community, equity and environment/economy come together. Conventional economic development, as we know it, has always assumed an open-ended, linear system with a limitless supply of inputs. The result has been an overwhelming emphasis on growth and productivity and a systematic "forgetting" of environmental and social costs. Sustainable development assumes a cyclical system, in which socio-economic and environmental inputs and outcomes are fundamentally related.

SUMMARY

The above material provides the broad outlines of our perspective on sustainable development. We share with most others working in this area a concern with environment/economy relationships. We emphasize more than many others the importance of locality--of community--in development, and of equity--of distributional issues.

REQUIREMENTS FOR A FRAMEWORK FOR ANALYSIS

VALUES

We have been working for some time on a framework for analyzing/evaluating sustainable development. We have determined that, to be useful, our framework must be able explicitly to identify values, principles, goals and measures which are consistent with the perspective on sustainable development. In particular, the starting point is in the values represented by the three basic themes of community, equity and environment/economy described above.

PRINCIPLES

During our examination of communities actively committed to sustainable development, we found great differences in the ways in which sustainable development is being organized and acted upon. We also found, however, some striking similarities, in principle and in strategy, which have allowed us to define a process for planning sustainable development. The planning process itself and the strategic similarities it encompasses are described in detail elsewhere.[4] For the purposes of the evaluation framework, the six common principles which emerged from our research are important:

The first principle is based on the first central theme of sustainable development--*Community*. Whether they begin with the policies and programs of the state, in the head offices of large corporations, in the workplace, or at someone's kitchen table, the end result of sustainable development initiatives must be the creation of sustainable communities. The motivation for sustainable development lies in the affiliations which people have with each other, in the sense of shared destiny which defines communities.

The second principle is *Equity*. People are partners with their ancestors, their grandchildren, their neighbours within and across communities, and with other species, in an ongoing effort to develop and maintain optimum states of well-being. Similarly, communities, regions and nations are partners with each other in their efforts to maintain and enhance the environmental, social, and economic viability of the world that they share. Equality of opportunity and respect for the choices and needs of others, within and across communities and generations, are basic requirements of the process and outcomes of sustainable development.

Self-determination, the third principle, brings the first two together. People not only have the right to well-being, but they also have the right to decide what that means and how it should be achieved, unless and until they infringe upon the rights of others to do the same. One implication of this is an emphasis in sustainable development on strategies directed toward greater local self-reliance. The greater the level of local self-reliance, the less likely it is that a community or group of communities will infringe on the rights of others. Another implication is that those who receive the benefits of development must also bear the costs directly. Finally, there is an emphasis on the education and empowerment of people so that they have the knowledge and resources that they need to make wise decisions.

The third central theme of environment/economy is expressed in the fourth principle of *Integration*. Economic viability, environmental integrity and social equity cannot be considered in isolation from one another. Environmental and human well-being are interdependent. Sustainable development requires a new emphasis on relationship, on connection, and on non-linear approaches to thought and action.

Balance, the fifth principle of sustainable development, creates a context in which development cannot be seen as the pursuit of growth, although growth may be one of its outcomes. Sustainable development processes are themselves a matter of balance, an incremental process of striving to improve states of well-being without infringing on the rights of other generations, other species, or other people in other places to do the same. They involve negotiation, mutual respect and a careful accounting of the practical meanings of socio-economic and environmental interdependencies.

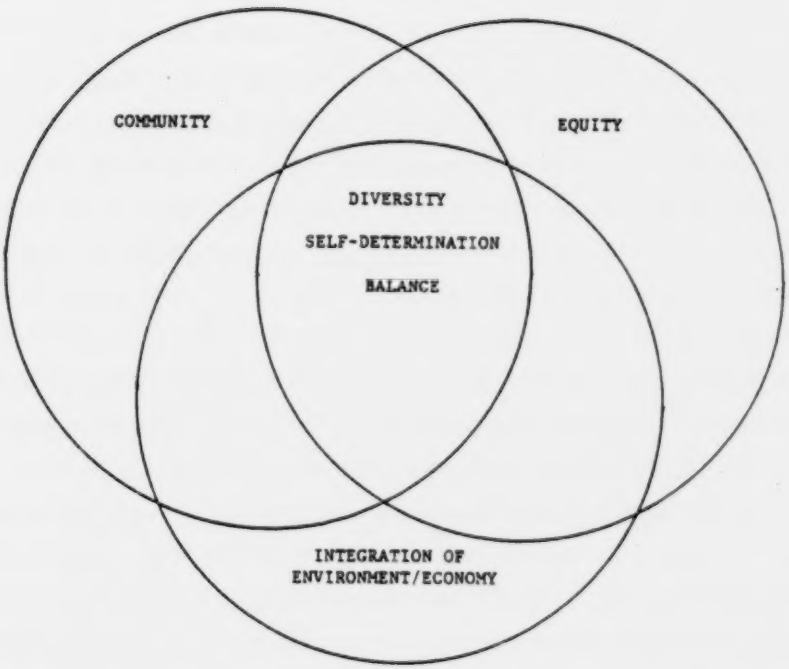
The final principle is *Diversity*. A balance between integration and diversity provides a source of vitality and resilience. Sustainable development requires multi-dimensional approaches, and an understanding of the importance of apparently opposing ideas and actions to each other. People committed to sustainable development, for example, will need to take an active approach to resisting what works against the development of sustainable communities in their own lives and renewing or nurturing what enhances sustainable development. Development itself is about both persistence and change. It is at the same time local and global, scientific and spiritual, socio-economic and environmental.

GOALS

We have identified three basic goals appropriate for the new paradigm of sustainable development. These goals depart from a growth-dependent, environment *or* development perspective to embrace an understanding of how to support development which is based on the values and principles described above.

Figure 1

Principles



Responsibility. Environment and economy are both socially constructed. It is people, not plants and animals, who determine how we define and value the world around us. And it is people, rather than technologies or capital, who determine what economic activities we engage in and how they transform our communities. People at every level of society are responsible to members of their broader communities for their socio-economic activities and the impacts of those activities on other people in other places and at other times, and on the environment which supports those activities. In this sense, responsibility requires a highly-developed sense of mutuality and a strong emphasis on co-operation.

Autonomy.[5] Increased decentralization in decision-making is necessary if the ethic of responsibility is to be effectively implemented at all levels of society. In general, the closer one is to the action, and the more one's life is directly affected by it, the more responsibility and authority one should have with respect to it.

Self-Reliance.[6] If people and their communities, and the agencies and institutions which work on behalf of these communities, and the governments which set the policy frameworks for organizations, institutions and communities are to be autonomous and responsible, they need the human, financial, material and environmental resources to be able to make responsible decisions and take autonomous action. The central orientation must be to sustainable livelihoods and to the small projects and consideration of the informal economy which the idea of sustainable livelihoods implies.

MEASURES

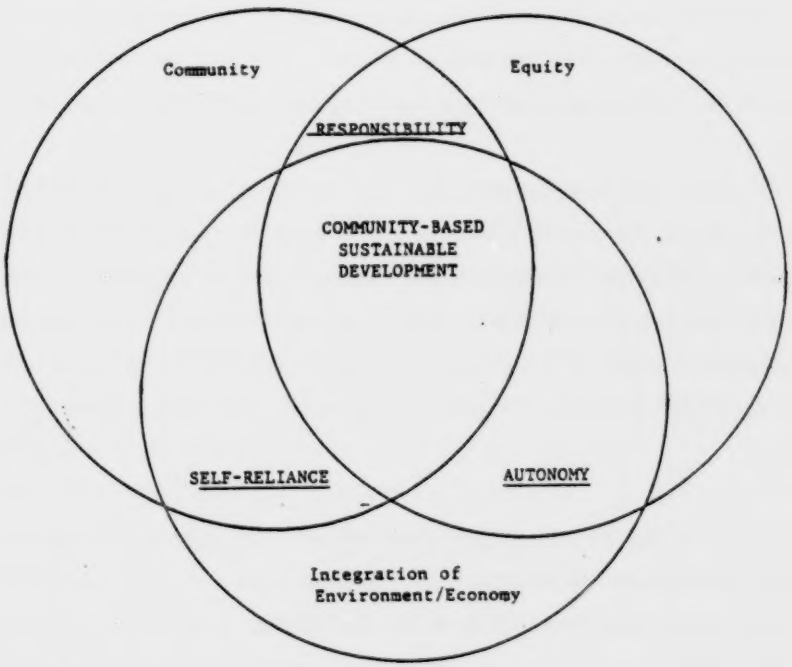
Questions about how to identify appropriate measures and indicators for the assessment and evaluation of sustainable development are obviously not straightforward.

In order to answer those questions, we must be prepared to work across as well as within disciplines and to say "both/and" in situations where we are more accustomed to saying "either/or." The conceptual challenges, then, may well be far more formidable than the practical ones in the area of evaluation and analysis. In our work, we have determined that it will be important to develop measures along four dimensions, each of which informs the other:

1. planning and decision-making;
2. socio-economic impacts;
3. environmental impacts (biophysical and built);
4. integrated impacts--the functional relationships among the other three, including process-related concerns and reverberating effects.

Figure 2

Goals



Planning and Decision-Making

The first dimension is planning and decision-making. Like all other dimensions, it has relevance for each of the goal areas, but it is most strongly related to the goal of responsibility. Our work in defining a community-based planning process for sustainable development has also set out for us some basic requirements with respect to the types of measures and indicators required (see Figure 3). We have determined, for example, that evaluation must consider process and outcome in an integrated fashion; that methodologies must be formative as well as summative; and that measures must be both qualitative and quantitative.

We have also determined that the evaluation of planning and decision-making in sustainable development cannot proceed independently of analysis of desired outcomes in the socio-economic and environmental areas.

Socio-Economic Impacts

The second dimension, socio-economic impacts, is most closely associated with the goal of self-reliance. In this area, we have discovered that traditional economic analysis provides a place to start, but tends to leave out too much. We have been influenced here by our own work on informal economic activity and by the work of others.[7]

We are also influenced by our knowledge that Canada, as a signatory to the UN Charter of Human Rights and through our own legislated Charter of Rights and Freedoms, is committed to providing for all its residents a degree of personal well-being sufficient to allow each person to meet the basic needs of her/himself and her/his family with a measure of dignity. Economic activity in this context can best be defined as arrangements of time and effort which constitute meaningful and productive work, both paid and unpaid, formal and informal. The socio-economic dimension of our framework must take into account not only the need to provide sufficient opportunities for meaningful work, but also the provision of choice which is inherent in the equity provisions of the Charter of Rights and Freedoms. The two key concepts, then, are meaningful work and choice.

Three critical tasks for evaluation along the socio-economic dimension are:

1. to examine the relationship of new organizations in communities to the creation and/or redistribution of employment, in order to answer the question: is this development initiative able to assist local residents to overcome previously insurmountable barriers to finding and keeping sources of meaningful and productive work?;

Figure 3

Requirements

Principles	Strategic Characteristics	Requirements
Community		-community-based -in community interests
Equity		-democratic -participatory -promotes equality of opportunity -clarifies common values
Self-Determination	Vision Social Learning	-open -accessible -promotes self-management
Integration		-systemic -synergistic -acknowledges inter-dependencies
Balance	Conservative Change processes Time-space	-cyclical -incorporates ecological principles
Diversity	Persistence Tradition	-inclusive -embraces opposites

2. to determine the degree to which individual initiatives identify and meet socially defined needs by providing services, products and information which enhance quality of life in a way which is generally recognized; and
3. to determine the degree to which the initiatives are able to enhance the built and biophysical environments in which communities are located, i.e., the degree to which initiatives enhance the quantity and quality of the collective goods available to any particular community.

In our search for questions and measures for evaluation with respect to the socio-economic dimension, social impact assessment methodologies are proving to be useful in defining the scope of the evaluation, in identifying alternative futures and in assessing their relative value to local residents, and in identifying potential impact areas and approaches to their measurement and analysis.

Environmental Impacts

Environment impacts are most closely related to the third goal of autonomy. In analyzing biophysical environmental impacts, we are examining and adapting conventional approaches to environmental impact assessment and are able to draw on efforts such as the World Conservation Strategy for guidance.[8]

In analyzing the built environment from a sustainable development perspective, we believe that it will be useful to adapt the four "Rs" of "Reduce," "Reuse," "Recycle" and "Recover" to our framework. We will also wish to include some recognition of the importance of amenity and aesthetics in the built environment, in measures developed along this dimension.

Integrated Analysis

The fourth dimension, which analyzes the functional relationships among the other three is one which we know to be essential, but about which we still know relatively little. As we clarify our understanding of the elements of the other three dimensions, however, its characteristics are beginning to emerge. It is perhaps in this area that we will be able to capture within our evaluation framework the aspect of sustainable development related to individual and community commitment and valuing of a better world on behalf of people and species which they may never encounter. Moving into this spiritually defined territory is clearly somewhat dangerous, given the importance of personal and cultural beliefs to its expression, yet clearly, it is in many ways the heart and soul of sustainable development. Any evaluation framework which does not recognize that will always be inadequate. We can only hope that

our ability to engage in multi-dimensional, integrated analysis is equal to the challenge which appears to lie before us.

CONCLUSION

Sustainable development, as described here, is a new paradigm. It offers to development planners a critically important opportunity to find ways to redefine their work, and, in so doing, to work toward a "socially just, ecologically wise, economically viable" world.[9] The opportunity is also an imperative. We have little choice but to embrace it with all its inherent dangers and take whatever guidance we can from it. Above all, it will be essential to recognize the need for structural changes in conceptualization, action and analysis. A slightly "greener" version of "business as usual" will not be enough. We must accept that what we are working toward is actually what one author has referred to as "uncommon futures."[10]

NOTES

1. Gro Brundtland, Chair, *Our Common Future* (London: Oxford University Press, 1987).

2. Worldwatch Institute, *State of the World Report, 1988* (Washington: Worldwatch Institute, 1989).

3. Susan Wismer and Siobhan Farrell, *Home-Making: An Action Plan on Housing* (Guelph: Guelph Status of Women Action Group, 1988).

4. Susan Wismer, *Sustainable Development in Canada: A Community-Based Approach* (forthcoming, 1991).

5. *Autonomy*: On a personal level, autonomy means competence, self-determination, independence. The central dynamic of autonomy is responsible choice. Institutional support for autonomy requires flexibility, adaptability and openness. Lawrence Haworth, "Orwell, the Planning Profession and Autonomy," *Environments*, 16,2 (1984): 10-15.

6. *Self-Reliance*: A concept of development based on doing what is possible with local resources in order to meet the needs of any given community's people. Self-reliance is not the same as self-sufficiency. Self-reliance does not require economic isolation. Trade is encouraged, as long as it is equitable and as long as it does not interfere with the priority use of local resources to meet local needs.

7. See, e.g., Hilkka Pietila, "Tomorrow Begins Today" (Paper presented in workshop at Forum 1985, Nairobi).

8. International Union for the Conservation of Nature, *World Conservation Strategy* (Gland, Switzerland: IUCN, 1980).

9. Ignacy Sachs, *Development and Planning* (Cambridge: Cambridge University Press, 1987), p. 26.

10. Julia Gardner and Mark Roseland, "Thinking Globally: The Role of Social Equity in Sustainable Development," *Alternatives*, 16,3 (1989): 26-35.

COMMUNITY PLANNING AND SUSTAINABLE URBAN DEVELOPMENT

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The term "sustainable development" has been with us for some three years now since it was first popularized by the World Commission on Environment and Development (WCED) in its report, *Our Common Future* (WCED, 1987). The Commission was initiated by the United Nations General Assembly in 1984 to study critical issues of environment and development, and to formulate action proposals to deal with the related issues of environment and development.

The timing of the WCED is indicative of the nature of its mandate:

- Developing countries, still experiencing high rates of population increase and dangerously low consumption levels, are poised for major industrial and economic development similar to that which has created the environmental crisis in the more developed world.
- The more developed world has reached low levels of population growth, but ever increasing levels of consumption, raising an alarm about the depletion of renewable resources.
- There is an increase in global throughputs, causing increased environmental degradation.
- The major task facing the world is to reduce environmental degradation, while ensuring that Third World development can proceed in the interests of global equity.

The WCED concluded that economic activity would have to increase five- or tenfold over the next fifty years to enable those who live in developing countries to achieve basic needs for food, clothing and shelter and to reduce absolute poverty. Although such an increase may sound enormous to some, and raise alarm bells about its consequences for the environment, in reality it represents a modest annual growth rate of 3.2 percent to 4.7 percent in world economic activity (MacNeill and Cox, 1989). A growth of this magnitude is not only possible, but also likely given the historical growth of real GDP in the world between 1965 and 1987. The most populous countries of the world, China and India, registered growth rates of 4.9 percent to 8.6 percent throughout that period. As a group, developing nations registered annual GDP growth rates of 3.2 percent to 6.5 percent during the same period (Table 1). WCED observed that economic activity would have to increase in both the developed and developing world in order to sustain the global economy.

Having recognized the inevitability of increased economic activity in the world over the next fifty years, the WCED turned its attention to the consequences of such growth on the environment. It concluded that if future growth creates the same kind of environmental degradation that has been witnessed in the more developed world, the growth could not be sustained because the very resources on which growth depends would be undermined. The WCED, therefore, concluded that growth would have to be environmentally sustainable , i.e., it would have to be based on processes and forms of development which do not degrade the environment. It used the term sustainable development to describe such growth, and defined it as:

TABLE 1
GROWTH OF REAL GDP, 1965 TO 1987
(annual percentage change)

Country Group	Average, 1965-73	Average, 1973-80	Average, 1980-85	1986	1987
Industrial countries	4.5	2.8	2.4	2.7	2.9
Developing countries	6.5	5.4	3.2	4.7	3.9
Low-income	5.5	4.6	7.4	6.4	5.3
- Excluding China and India	3.4	3.4	3.0	4.8	4.5
- China and India	6.1	4.9	8.6	6.8	5.4
- Low-income Africa	3.6	2.0	0.7	3.7	3.0
Middle-income	7.0	5.7	1.6	3.9	3.2
Oil Exporters	7.0	5.9	0.9	0.3	0.8
Exporters of manufactures	7.4	6.0	5.8	7.2	5.3
Highly indebted countries	6.9	5.4	0.1	3.5	1.7
High-income oil exporters	8.7	8.0	-2.5	-8.1	-2.9

Note: Data for developing countries are based on a sample of ninety countries.

Source: United Nations: World Development Report 1988

> development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Since growth is accepted in the interests of the poor in the developing nations, the WCED placed emphasis upon the equitable distribution of the benefits of growth within nations (WCED pp. 50-51). Moreover, since environmental degradation is really a function of population times consumption of resources, WCED pointed out the need both for ensuring sustainable levels of population as well as for preventing the further depletion of the resource base through the conservation of resources, the prevention of waste, and by the reduction of the energy and resource content of growth. It recognized that advanced technology will be required to improve productivity and to reduce environmental degradation. In this context, greater international co-operation will be required. Altogether, it identified eight means or "strategic imperatives" for achieving sustainable development:

1. reviving growth to meet human needs and aspirations;
2. ensuring a more equitable distribution of the proceeds of growth;
3. ensuring a sustainable level of population;
4. conserving and enhancing the resource base;
5. reducing the energy and resource content of growth;
6. reorienting technology and managing risk;
7. merging environment and economics in decision-making;
8. strengthening international co-operation.

It is obvious from the above list that sustainable development as conceived by WCED has many dimensions, and is a complex global concept. It provides a framework within which the various actors involved with environment and development can define their own directions, roles and responsibilities.

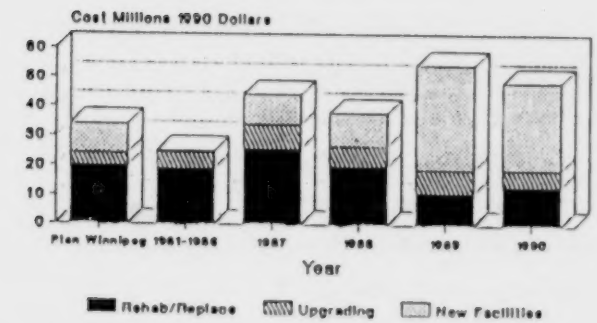
COMMUNITY PLANNING AND URBAN DEVELOPMENT

This paper is concerned with the role which community planners in Canada can play in achieving sustainable development in Canadian urban communities. Since community planning is concerned primarily with physical planning for the allocation of land and services in the context of urbanization, its interventions influence the pattern of urban growth and the spatial distribution of population, services and amenities in the community.

According to the WCED, the principal problems associated with cities in countries like Canada are deteriorating infrastructure, environmental degradation, inner city decay, and neighbourhood collapse. As a consequence, certain disadvantaged groups have been trapped in a downward spiral of degradation and poverty in declining areas, while those with resources move out to other areas of the city (p. 241).

FIGURE 1

STREETS AND TRANSPORTATION
ANNUAL CAPITAL PROGRAM
BY CATEGORY TYPE



Source: City of Winnipeg

This characterization of the current urban problems is consistent with contemporary explanations of urbanization processes in the developed world (Hall, 1984) as well as with the literature on current city problems (Gappert and Knight, 1982; Halcomb and Beauregard, 1981). Most analyses of the problems have linked them to urban development policies pursued by the industrial countries in the post-war era.

One feature of these policies, and perhaps the one over which community planners exercise a degree of influence, is the continued development of new, low-density suburbs. This activity has been cited as the reason for many of the present problems faced by cities. Within the context of energy and resource consumption, suburbs, with their low densities, consume large quantities of land resources, and because they are built farther and farther from the city centre, progressively increase the use of private automobiles and hence the consumption of fossil fuels. They generate growing demands for new roads and expressways, and their low density makes it difficult to provide public transportation economically and efficiently (Sewell, 1977; Blumenfeld, 1980). From an energy and resource conservation perspective, low density suburban development is clearly undesirable. During times of low growth, the building of new, low-density suburbs also adversely affects the built-up areas of the city. As newer suburbs are built, the older areas (including older suburbs) of the city lose population, sometimes in absolute terms. Infrastructure and services in the older areas are under-utilized, while new infrastructure and services have to be extended to the new suburban areas.

Due to the appropriation of capital funds for extending services to the new suburbs, the maintenance of existing infrastructure is neglected, driving more people to the new suburbs. There is substantial evidence from cities across North America that the per capita costs of services are linked to development patterns (Real Estate Research Corporation, 1974). As outward growth becomes increasingly dispersed, higher per capita municipal investment is required for operating and maintaining services, as well as for capital expenditures (Spangler, 1963; Schaller, 1963; Bahl, 1969). Since suburban development is characterized by lower densities, capital expenditures for linear services such as drainage systems, sewer, water, roads, boulevards, street lighting and sidewalks are increased as are the costs of maintenance. In addition, the capital and operating costs per capita associated with providing "soft" community services (e.g., schools) are also higher at low densities.

Figure 1 shows that the emphasis of Winnipeg's capital works in streets and transportation has become increasingly skewed toward the installation of new facilities at the cost of investment in rehabilitation, replacement and upgrading--important factors in maintaining service standards. The city faces a gigantic maintenance backlog. The continued proliferation of new low-density suburbs thus negatively affects the inner city and older suburbs, and leads to inner-city decay, the collapse of older suburban areas and the deterioration of infrastructure.

TABLE 2
POPULATION CHANGE: ST. JAMES-ASSINIBOIA SCHOOL DIVISION

Year	St. James-Assiniboia Population	% Change	Metropolitan Winnipeg Population	% Change	St. James -Assiniboia as a % of Metro Winnipeg
1901	614		44,359		1.4
1911	6,016	879.8	143,518	223.5	4.2
1921	12,769	112.8	229,212	59.7	5.6
1931	18,563	45.4	294,905	28.7	6.3
1941	18,100	-2.5	302,024	2.4	6.0
1951	25,139	38.9	354,069	17.2	7.1
1961	44,434	76.8	475,989	34.4	9.3
1966	59,255	33.4	499,878	5.0	11.8
1971	70,110	18.3	535,233	7.1	13.1
1976	70,340	0.3	560,874	4.8	12.5
1981	67,720	-3.7	564,470	0.6	12.0
1986	66,685	-1.5	594,551	5.3	11.2

Source: Institute of Urban Studies

Moreover, because new suburbs are targeted toward specific homogeneous groups, i.e., young families, move-up buyers or seniors, they require a disproportionate volume of services unique to the target groups (e.g., schools), if the group consists of young families, golfing if the group consists of move-up buyers, and so on. As the population enters the next stage of its life cycle, services initially provided become redundant, and new services, consistent with the life cycle, have to be provided. The lack of diversity in population groups gives a low degree of sustainability to the suburb. At the same time, it denudes the older areas of their diversity by siphoning off selected groups.

The issues related to sustaining under-utilized urban services in declining areas are varied and complex. They raise questions about the wisdom of permitting continued outward expansion, as well as about the capacity of existing institutions to cope with change. A Winnipeg example can serve to illustrate these issues.

THE CASE OF ST. JAMES-ASSINIBOIA SCHOOL DIVISION

During the past decade, new suburban areas absorbed 65 percent of the population growth in Winnipeg. Most older suburbs either experienced no change, or net losses in population (Institute of Urban Studies, 1990). The St. James-Assiniboia School Division (Figure 2) experienced a net population loss during 1976-86 (Table 2). The area is typical of the new, low-density suburbs built during the post-war era to accommodate young families. The developers targeted their homes to large families (3 or more children). As a consequence, the area attracted a disproportionate number of Winnipeg's larger families with young children (Table 3). A large number of schools were built to accommodate the school-age population. The relatively large household size, coupled with the number of dwelling units per acre, yielded a viable school age population for neighbourhood schools to be located within a quarter-mile (0.4 km) walking distance from home. This was the desired standard during the times. In 1971, schools in the area are reported to have been "bursting at the seams." By 1986, enrolment had fallen to about 55 percent of the 1971 level (Table 4), and the School Division faced rising costs per pupil despite closing down a number of schools.

A study (Institute of Urban Studies, 1988) commissioned by the School Division revealed that the drop in enrolment was the result of demographic change, aging in place and the loss of population to newer suburban areas. Consequently, the reduced household size and the changed age structure (Figure 3), when coupled with the unchanged number of dwelling units per acre, did not produce the number of pupils required by the schools. The new demographic profile required a larger catchment area to fill the capacity of the school--a 0.7 km walk instead of 0.4 km (Table 5). Thus, there was considerable overlap in school catchment areas (Figure 4), and as a result, most schools faced low enrolments.

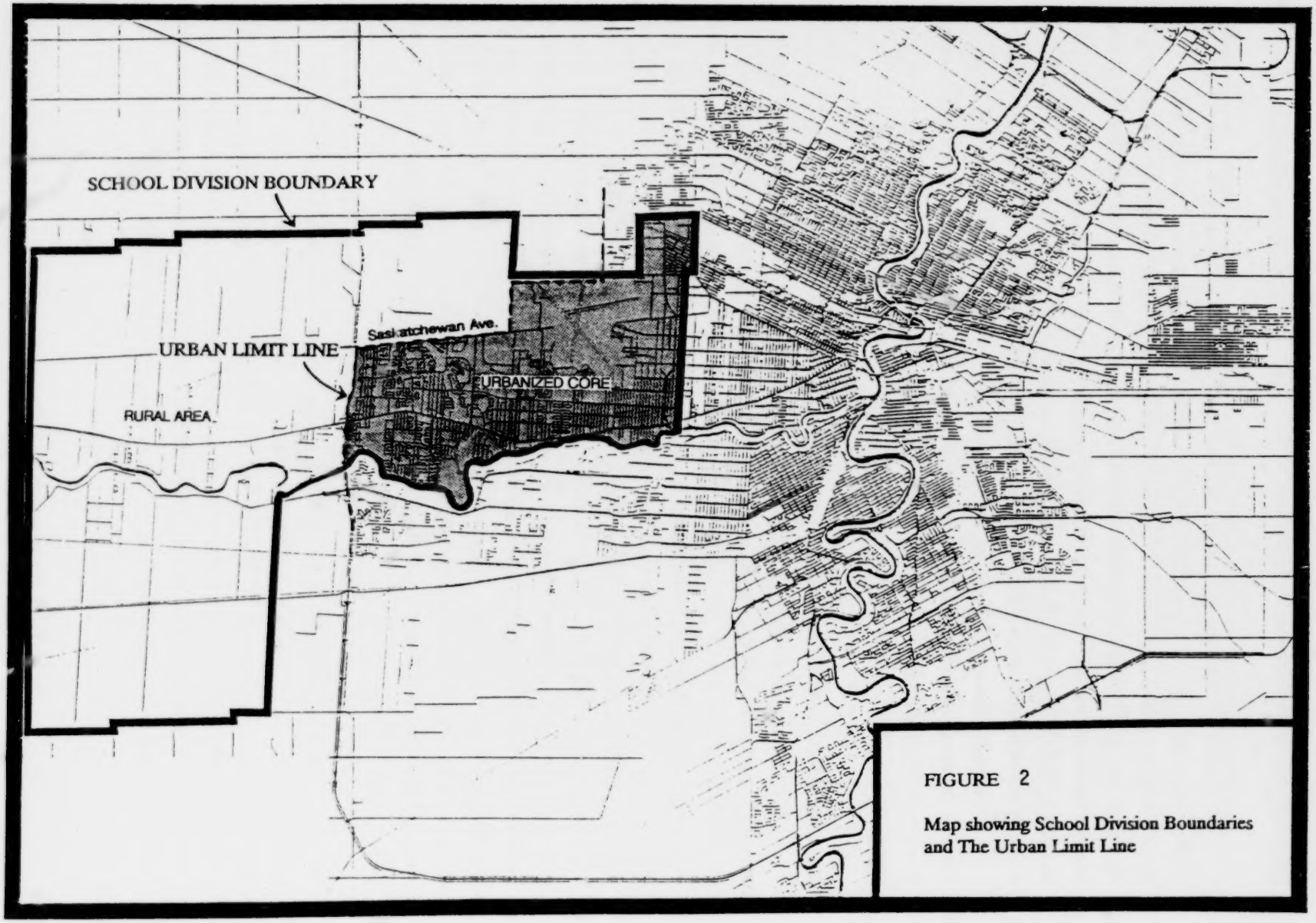


FIGURE 2

Map showing School Division Boundaries and The Urban Limit Line

The study also noted that the problem of low enrolment in the School Division was exacerbated by the fact that at the time of its establishment, the area had a disproportionately large number of Winnipeg's school-age children. The parents of many of these children had aged in place, preventing younger families to move into the area to replenish the stock of school age children. The aging in place was more pronounced in the area than in the city as a whole. The low diversity in age structure at the time of establishment of the area had made it harder to cope with change.

The School Division faced a dilemma. Should it close down more schools? If it did that, how should it cope with the surplus space and the surplus staff? As regards the issue of space, the School Division could sell the land or "moth-ball" the schools. If the schools are simply moth-balled, the space becomes derelict, and a haven for undesirable activities. If the property is sold, the School Division forecloses the option to provide schools should demographic conditions change in the future. Moreover, residents of the area were concerned with future uses of the site. These problems of surplus physical plant seem less onerous than the issue of dealing with the surplus staff. Should the School Division lay off teachers, or reduce student-teacher ratios? Either option is difficult. Quite apart from the question of surplus physical plant and staff is the issue of which schools should be closed, and what is an acceptable distance for pupils to commute. Beyond what distance should the School Division provide bussing?

While communities such as St. James-Assiniboia struggle with school closures, new schools are constructed in the newer suburbs which siphon off what little growth there is, undercutting the prospects for revitalization of the older suburbs, adding more waste, more under-utilization of services and the consumption of land resources. Such urbanism flies in the face of sustainable development. How can community planning respond to this phenomenon? What are the constraints to such responses? The remainder of this paper addresses these questions.

COMMUNITY PLANNING FOR SUSTAINABLE URBAN DEVELOPMENT: IMPERATIVES AND CONSTRAINTS

The foregoing discussion raises several issues related to community planning. First, the tendency to develop suburbs to cater to specific age or income groups creates weak communities which are not capable of responding to changed circumstances of life cycle or demographic shifts. When new suburbs are created to attract one target group, a specialization is created not only in the new suburb, but also in the older areas from which the new suburb attracts residents. It is this process which creates new communities of move-up buyers, young families or seniors, while often leaving the older areas of the city with relatively disadvantaged populations. The approach to resolving this problem is to ensure that all urban communities offer a greater diversity of housing types to accommodate all income and age groups,

TABLE 3
FAMILIES WITH THREE OR MORE CHILDREN 1971 AND 1986
ST. JAMES-ASSINIBOIA AND WINNIPEG

Area	Percentage of Families With Three or More Children	
	1971	1986
Winnipeg	23.3	13.0
St. James-Assiniboia	28.5	11.0

Source: Institute of Urban Studies

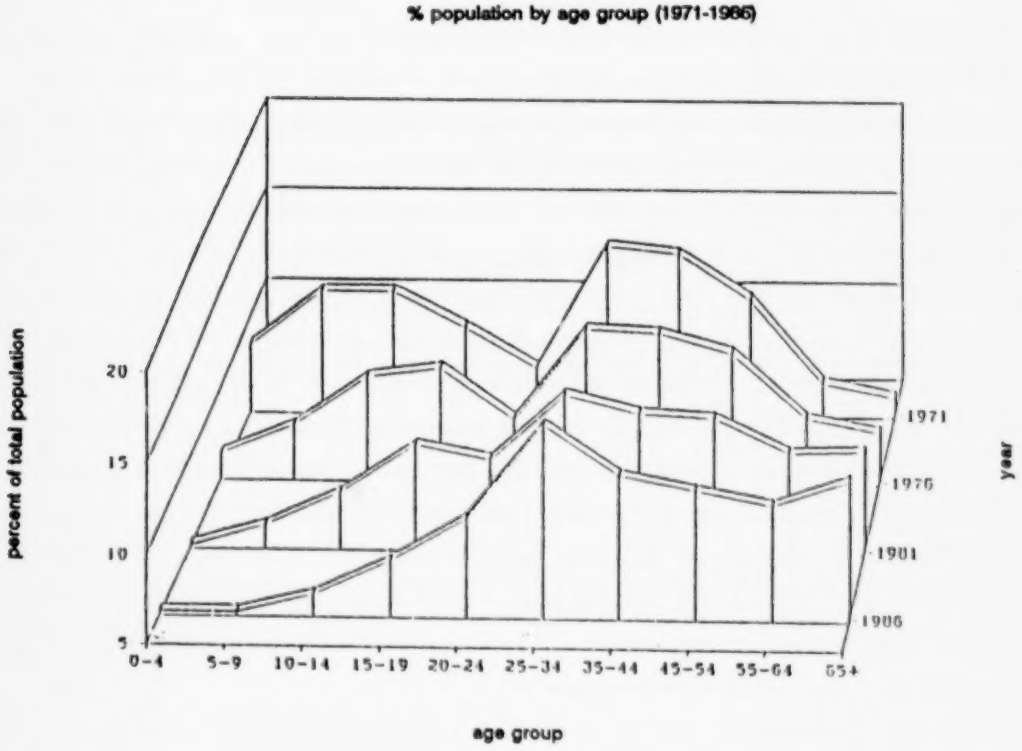
families and non-families. The principal constraint to such an approach is that the mix of housing is decided by public preferences, and private builders whose approach to housing is based (understandably) on competitive marketing strategies geared to specific target groups, rather than to the considerations of long-term viability of the community. By the time the community reaches the stage where lack of diversity begins to threaten it, the developer is long gone. Municipal governments--particularly in the current neo-conservative environment--are loathe to set guidelines for development standards, let alone set guidelines for housing mix. "The market knows best" is the current approach to housing and urban development in Canada. Unfortunately, "market knows not, other than current profit" is the reality.

Second, the neighbourhood planning concept and norms used by community planners were formulated in the 1920s and '30s to cater to the young family of that era. The combination of family size of that time, and the desired densities of approximately six dwelling units to the acre, yielded enough pupils in a quarter-mile radius to run one elementary school economically. The economics of the school were based upon the then-prevailing curriculum and norms respecting student-teacher ratios. Although family size in the 1980s and '90s is substantially different from the norm in the 1920s and '30s, and the economics of running schools have drastically changed because of new curricula, technological advances and new norms for student-teacher ratios, neighbourhood design principles remain relatively unaltered. Moreover, parents still expect that their elementary school children will not have to walk more than a quarter-mile to school while they live in the six dwelling per acre subdivision and have fewer children. A logical response to the problem of smaller families is to increase residential densities in the low-density neighbourhoods and to rethink the neighbourhood unit of the 1920s and '30s. The principal constraint to these responses is the deep-rooted Canadian dream to live in low-density suburbs. However, the reality is fast catching up, as more and more neighbourhood schools close down, while education taxes continue to rise to support uneconomic schools. Soon, Canadians will have to make a tradeoff among education costs, accessible schools and low densities.

Third, schools are only the most visible element of under-utilized service infrastructure in older neighbourhoods. The remainder of that infrastructure in older neighbourhoods is buried underground, and although out of sight, it takes precious municipal revenues to maintain. Sometimes, it is not maintained for want of funds, adding further to deterioration. It is estimated that Canadian municipalities require between two and four billion dollars to renew infrastructure. Quite apart from the problems generated by the under-utilization of hard services, is the problem of what to do with abandoned service infrastructure such as schools. Although buildings can be used for providing other needed amenity spaces such as, for example, adult education, seniors' centres and group homes, intractable issues of

FIGURE 3

ST. JAMES-ASSINIBOIA SCHOOL DIVISION #2



land use, operating standards, who pays for conversions, who owns the land and who operates the buildings seem to take years to resolve, because of institutionalized and bureaucratized processes, multiplicity of jurisdictions and lack of consensus within the local community. There is no simple response to this problem. Its resolution would require institutional reform, in order to create greater flexibility, accommodation of different circumstances, decentralization of decision-making and simplification of jurisdiction.

Finally, it is time to recognize that the problems of deteriorating infrastructure, inner-city decay, under-utilization of services and the decline of older neighbourhoods are directly linked to the continued growth of new low-density suburbs. This equation has two components. On the one hand, new suburbs attract selected groups of residents from older areas, as has already been discussed. On the other hand, scarce capital funds from the public purse are spent on extending infrastructure at the cost of maintenance and renewal in the older areas. A two-pronged approach to this problem is required. First, cities should limit the suburban areas and divert the bulk of the housing activity to the existing built-up areas in the form of infill and densification. Second, the bulk of capital funds should be allocated to the maintenance and renewal of the already built-up areas. There are several constraints to these responses:

1. A moratorium on new low-density suburbs within the city limits will merely drive the demand to outlying municipalities unless complementary policies are adopted by those municipalities. This would require intermunicipal co-operation--something that has not been possible in the past in most urban regions. Strict regulation by the provincial government may be required. This is highly unlikely to materialize given the present pro-development ideology of most provincial governments and the fear of political fallout.

2. Most Canadians value their dream of a home in the low-density suburb. Most are probably not ready to accept a lesser alternative.

3. The land-development and home-building industry will vehemently oppose the limitation of new suburban housing activity. Given the predisposition of most municipal councils in favour of land development interests, the views of the urban development industry are likely to prevail.

It should be obvious from the above discussion that public attitudes, political and social beliefs, systemic rigidities, and institutional barriers are the principal constraints to achieving sustainable urban development. Systemic rigidities and institutional barriers are easier to resolve than are constraints imposed by attitudes and beliefs. In fact, the change in attitudes and beliefs is a *sine qua non* for systemic and institutional reform.

The evident conflict between the proposed responses to urban problems to satisfy the imperatives of sustainable development, and the prevailing attitudes and beliefs in society, indicate a gap between the values of sustainable development and those prevailing in society. This gap can best be understood in terms of Merchant's (1990) taxonomy of ethical approaches--egocentric, homocentric and ecocentric--

TABLE 4
ST. JAMES-ASSINIBOIA SCHOOL DIVISION NO. 2, ENROLMENT PROFILE

YEAR	ENROLMENT	DECLINE
1971	20,679	
1972	20,294	385
1973	19,831	463
1974	19,184	647
1975	18,068	1116
1976	18,620	+552
1977	17,879	741
1978	16,795	1084
1979	15,931	864
1980	14,631	1300
1981	13,909	722
1982	13,505	404
1983	13,129	376
1984	12,663	466
1985	12,216	447
1986	11,875	341

Source: St. James-Assiniboia School Division No. 2. *Long Range Plan* School Accommodation and Staff Requirements: A Five Year Student Enrolment Projection. December 1986.

which underlie the positions of various interests engaged in struggles over land and natural resource uses. The common beliefs and examples of these approaches are set out in Figure 5. Within this taxonomy, the values of sustainable development would appear to be largely homocentric, while those which guide public attitudes and beliefs related to urban development are largely egocentric. Since both sets of values have their roots in Christian doctrine and are reflected in the ideologies of political parties, individuals often move from one to the other depending upon their stage in life and their personal circumstances. It is conceivable that the realization of a personal stake in the future of the city could shift public attitudes and beliefs in favour of the responses discussed in this paper. The recent public concern for the environment and the growing public interest in sustainable development are encouraging signs that attitudes may be changing. Nevertheless, it may be a long time before attitudes change enough to influence personal decisions about such matters as the suburban home.

The responses suggested in this paper could satisfy several of the strategic imperatives of sustainable development identified earlier, yet the road to these imperatives seems riddled with obstacles. It is perhaps in recognition of these obstacles that the World Commission on Environment and Development had made the following insightful observation about the problems of cities in the industrialized world:

> With flexibility, space for manoeuvre, and innovation by local leadership, the issue for industrial countries is ultimately one of political and social choice.

Perhaps they might have added that things would have to get worse before those choices will be made.

FIGURE 4: PRESENT DUPLICATION IN SERVICE AREAS OF ELEMENTARY SCHOOLS

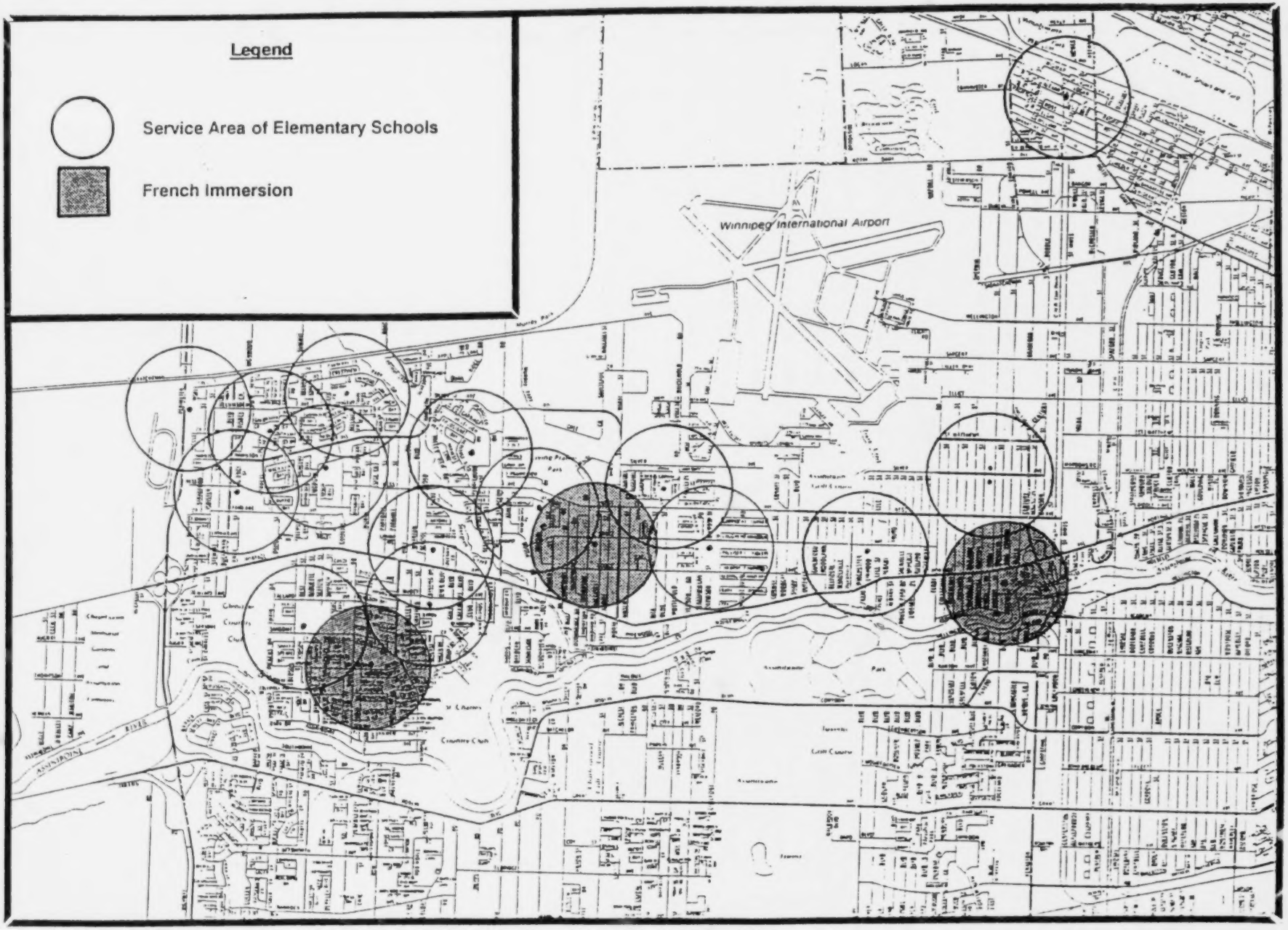


TABLE 5
SERVICE AREA AND SERVICE AREA RADIUS FOR DESIRED ENROLMENT OPTIONS
IN RESIDENTIAL AREAS OF ST. JAMES-ASSINIBOIA BY LEVEL OF SCHOOL*

Level of School	Desired Enrolment		Number of Dwellings to Provide Desired Enrolment		Service Area and Radius for Desired Enrolments Assuming 6 Dwelling Per Acre			
					Area in Km^2		Radius in Km	
	Minimum	Optimum	Minimum	Optimum	Minimum	Optimum	Minimum	Optimum
Elementary	300	500	1,363	2,273	0.94	1.57	0.54	0.70
Junior High	250	500	2,272	4,545	1.57	3.15	0.70	1.00
Senior High	350	1,000	2,333	6,667	2.23	4.62	0.84	1.21

*Assuming 0.22, 0.11 and 0.15 pupils pre dwelling for elementary, junior high and senior high respectively.

Source: Institute of Urban Studies

FIGURE 5
BELIEFS AND EXAMPLES OF ETHICAL APPROACHES TO THE ENVIRONMENT

EGOCENTRIC VALUES (grounded in individual)	HOMOCENTRIC VALUES (grounded in society)	ECOCENTRIC VALUES (grounded in ecosystem)
BELIEFS What is good for the individual is good for society	**BELIEFS** Greatest good for the greatest number of people Humans should conserve and protect nature for human benefit	**BELIEFS** There is intrinsic value to nature and nature must be preserved for its own sake
EXAMPLES *Laissez faire* Domination over nature Right to profit from land and resource development	**EXAMPLES** Government regulation of land and resources Environmental impact assessment Sustainable Development	**EXAMPLES** Ecologically based sciences Process-oriented philosophies The ethic of the environmentalists Bioregionalism Ecofeminism Green movement

Source: Developed after Merchant (1990).

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SUSTAINABLE DEVELOPMENT AND RECYCLING POLICY

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Canadians are, by several measures, the most profligately wasteful people on the face of the earth. We lead the world in per capita energy consumption. Each Canadian, on average, uses as much energy in a year from all sources as is contained in 8.8 metric tonnes of oil (expressed as 8.8 "tonnes of oil equivalent" or toe). The comparable per capita annual consumption figures for other regions are 7.8 toe in the U.S., 4.8 toe in the USSR, 4.1 toe in Eastern Europe, 3.4 toe in Western Europe, and only 0.5 toe in developing countries.[1] We also lead the world in generating 1.8 kilograms of waste per capita daily compared with our closest rivals in the U.S. at 1.63 kilograms and in contrast to the Norwegians at .77 kilograms/per capita/per day. And we trail the world with a recycling rate of 2 percent, compared with 10 percent in the U.S., 30 percent in Europe, 50 percent in Japan, and close to 100 percent in China.[2] Can we take seriously the federal government's goal at the heart of *The Green Plan*: "To make Canada, by the year 2000, the industrial world's most environmentally friendly country"? None of our actions are, to date, commensurate with this ambitious objective.

What would a social policy look like that could move us in this direction? Certainly the establishment of such a goal is an essential step to that movement, but we need also to understand how, specifically, that goal should be interpreted; why we must change direction; what are some of the impediments to doing so; what practical guidelines might instruct us how to get there; and what are the elements of a social policy that might stand some chance of success. In this paper I wish to reflect on these questions by focusing on what must be a key segment of such an environmental policy, namely waste reduction and recycling from a "sustainable development" framework.

THE FACTS OF LIFE

We are privileged to be alive, and to live on the only planet in the universe known to support life. Physically speaking, our planet is rather like a pool enlarging one side of a stream into which the water enters, swirls around a few times stirring up the sand, plants, insects, and fish that live in the pool and then exits downstream. The pool and its occupants are planet Earth and its biosphere, a more or less constant and finite store of materials. The water flow which stirs up the pool is the more or less constant influx and outflow of energy derived from solar radiation and re-radiated from the planet. Within this materially, but not dynamically, self-contained pool, the background entropic processes (the degradation and dispersion of organized and concentrated energy and matter in a closed system) are countered to some degree by other processes driven by the continuous energy flow from the sun. There are, for example, the processes that produce differentiated climate and weather patterns, and, associated with

that, the water cycle which continuously renews fresh water supplies through evaporation and precipitation. There is also the grand adventure of life, in which living beings "negentropically" achieve multiple levels and complexities of organization through a combination of abilities such as:

a. capturing solar energy and using it to create a transformation of inorganic into organic forms of matter ("biomass");
b. utilizing the materials provided by other living organisms for the organism's own substance;
c. forging an environmental niche out of the conditions established by other living things and the inorganic world;
d. transmitting organizational principles genetically to new organisms through reproductive processes;
e. engaging in an evolutionary process that multiplies and refines the variety of kinds of living organisms through mutation and natural selection;
f. in some species, progressively adapting behaviour through a learning process; and
g. in at least one of those cases, our own, developing social and cultural inventions and adaptations that are transmitted to others and to new generations.

Like every other form of life, we live dependent upon and conjoined with other living things in an ecosystem that utilizes and recycles a finite store of materials and is driven by a continuous influx of energy from solar radiation. And, like every other living thing, we must consume resources for our survival and well-being and in the process produce wastes. The continued availability of resources to humans depends crucially upon the continued recycling of materials and energy in natural systems. Within nature's cycles, what we emit or discard as waste has the potential to become another creature's resources and in the process be reconverted into resources that we can use. Without recycling, finite resources become depleted and wastes accumulate to the point where life becomes unbearable or impossible. Because recycling occurs in natural systems, *so long as these systems remain intact and are not overloaded*, wastes can be broken down and dissipated, resources renewed, and our opportunities to consume, and thus to live, extended.

But although natural *systems* recycle, individual organisms or species need not. All living things benefit from recycling even if none do it by themselves, since each occupies but a portion of the circuits in nature. Why, then, should we concern ourselves with recycling *within* the human economy? Why not just consume the resources we find, discard our wastes, and let natural systems as a whole do the recycling? That policy might work for a nomadic, low-density, low-consumption, stable population with neither escalating numbers nor growing per capita consumption of resources. But that is not ourselves.

Present rates and trends in the extraction-production-emission-consumption-waste process are simply not sustainable.

Although, like other organisms, we are consumers and waste-producers, our levels of resource consumption and waste generation are extremely elastic and have stretched enormously since the advent of the industrial revolution to reach unsustainable levels. In the past we have been able to tolerate and mask from ourselves the unsustainable character of our resource exploitation and waste production, because the short-term supply of mineral deposits, fossil fuels, fish and forests seemed plentiful enough, and our land, water and air apparently had an open-ended capacity to absorb our wastes. Even when environmental degradation was observed, it was readily justified as a price willingly paid for an increase in material prosperity.

LIVING AS THOUGH THERE IS NO TOMORROW: AN ECONOMY WHICH CANNOT LAST

Today, the mask hiding our unsustainable practices is falling and tolerance for environmental degradation ceasing. Valdez, Alaska knows that extending the supply lines for non-renewable and fast-diminishing oil brings with it increased environmental risks to vulnerable and precious ecosystems. Lynn Lake, Manitoba knows that the non-renewable resources we mine eventually will run out. The Maritime outports know that when fish are "mined," i.e., harvested at a rate that exceeds their regenerative capacity, trawlers and fish plants become idle. Inhabitants of British Columbia and the Temagami region of Ontario know that when the forests are "mined," either mills shut down or remnant reserves of virgin stands are invaded or both. Residents of Southern Ontario know that the capacities of land and water to contain our wastes harmlessly are finite and costly. Los Angeles, New England and Quebec know that the capacity of the atmosphere to absorb emissions without damage is less than present loadings. The combination of loss of livelihood, vanishing resources, overwhelming waste, threats to health, degradation and loss of inherited natural treasures, and dimming prospects for our children are stripping us of our environmental innocence.

Present practices are unsustainable in the long run for a variety of reasons:

1. We rely heavily on a continuous drawing from a finite supply of fossil fuels and concentrated mineral deposits, which, within the time frame of human history, are non-renewable and therefore exhaustible resources.
2. In the case of non-renewable resources, even a modest, non-escalating net consumption and wasting of the resource is unsustainable in the long run. *Indefinitely sustainable human life can be achieved only by totally eliminating the dissipative wasting of such*

resources into unrecoverable forms or by substituting renewable for nonrenewable resources.

3. Although we can surely become much more efficient in our resource use than at present, we cannot, strictly speaking, totally eliminate the dissipative wasting of non-renewable resources into unrecoverable forms. This is due to the fact that all transformations of matter and energy are subject to the entropy principle of physics. We can never achieve perfect efficiency in resource usage. Thus, although matter and energy are conserved in physical processes, they lose the concentrated, organized forms in which they are valuable to us as resources. And non-renewable resources are just those for which there is no compensating "negentropic" process to put them into concentrated, usable form again.[3]

4. Hence, for as long as we depend upon non-renewable resources, we are pushed from the more accessible to the less accessible reserves, where extraction and transportation are much more costly and threaten wilderness and ocean ecosystems, as the wreck of the Exxon Valdez grimly reminds us. Eventually, even the more remote supplies, extracted at tremendous economic and ecological cost, will give out.

5. Practically speaking, an energy source "gives out" at the point where the energy yield from it no longer exceeds the energy that must be expended to discover, extract and process the resource, even though vast reserves remain in the ground. According to the analysis in *Beyond Oil: The Threat to Food and Fuel in the Coming Decades*, the ratio of energy output to input for oil was 100 in the 1940s, 23 in the 1970s, and is now around 8. That is, only 8 barrels of oil are yielded now for each barrel consumed in energy production vs. 100 barrels of yield in the 1940s. Moreover, other energy sources fare worse; generating electricity from nuclear power has an output/input ratio of 4 (*excluding* reactor decommissioning), and electrical energy from Western strip-mined coal has a ratio of only 2.5 if the cost of scrubbers is included. *Beyond Oil* predicts that U.S. domestic supplies of oil will be used up by 2020 and world supplies by 2050. They also say that "by 2005 it will be pointless to continue exploring for oil and gas as energy sources in the United States: after that more energy would be used to look for these fuels than the oil and gas we found would contain" (p. 20).[4] Conservation measures can buy us time by stretching the period of supply for non-renewable resources, but ultimately, we must shift to renewable resources consumed on a sustained yield basis.

6. Low-entropy (i.e., concentrated and usable) resources, which are either solar or terrestrial in origin, can be characterized in terms of the dimensions of their stock or "capital" (the total supply) and flow or "income" (the rate at which they become accessible to us). Daly and Cobb point out that "Industrialism represents a shift away from major dependence on the stock-abundant solar source toward major dependence on the stock-scarce terrestrial source in order to take advantage of the variable (expandable) rate of flow at which we can use it" (pp. 196-97). In other words, our industrial economy has been built on a major shift towards unsustainable accelerating usage of finite and increasingly scarce resources, which must be reversed if sustainability is to be achieved.

7. In the case of energy resources, we are consuming our "capital" built up by biological and geological processes that have stored the sun's radiation from the past over aeons of time in the form of coal, oil and gas. A sustainable economy would eventually have to live mainly off the solar "income" alone, namely, the current radiation of the sun. In 1985, however, we were already consuming energy equivalent to 40 percent of the sun's radiation captured by terrestrial plant life on earth, an amount we could not possibly hope to capture from current solar gain without spending our accumulated solar "capital" in the form of fossil fuels.[5] Thus, it looks as though it is physically impossible to wean ourselves from fossil fuels and move to renewable energy sources at present levels of energy consumption.

8. In principle, renewable resources could sustain us into the indefinite future. But that can occur only if the rates of extraction do not exceed the rates of renewal. However, the rates of extraction of many of our resources, like timber and fish, have far exceeded the rates of renewal of these resources. It is Canada's shame that we continue to be almost entirely reliant on original old-growth forests for our timber industry, which has forced us to extend the cutting into millenia-old national wilderness treasures on the B.C. coast, and into marginal timberlands across Canada's North, that may take a hundred years or more to regrow to maturity.

9. Note also that the pressures on our forests and agricultural lands, and thus on our soils and water, will increase as fossil fuels give out or become much more expensive than the renewable alternatives derived from biomass. Yet many current agricultural and silvicultural practices are soil-destroying and depend upon the mining of non-renewable resources for fertilizers, pesticides and energy, and thus do not offer a genuinely

renewable alternative.[6] In any case, as previously noted, energy from land could not begin to supply current levels of energy consumption.

10. The biosphere is not only a storehouse of resources and treasure house of living organisms, species, and ecosystems; it is also sink and sewer for our wastes emitted throughout the extraction-production-consumption-trashing process. In part, this is a natural process; every organism emits and deposits its wastes, and these in turn are utilized by other organisms within the continuous material cycling of nature. Such emissions become unsustainable, however, when they are of kinds and volumes that exceed the capacities of natural systems to recycle. Both deliberately, through our synthetic chemical industry, and unintentionally, through by-products of various industrial processes, we have created a growing number of kinds and increasing volumes of materials that are not recyclable by natural systems. Instead, these accumulate in the atmosphere, land, water, and tissues of living organisms, including ourselves, in ways that are harmful or lethal to us and to other living things. The continued production and release into the environment of substances of such kinds and volumes as are not naturally recyclable is unsustainable. Ecosystems become progressively degraded, living forms become weakened and extinguished, climatic conditions may alter beyond the ranges of natural variation, and human health and welfare become threatened.

11. The title of the Club of Rome study, *Limits to Growth*,[7] suggests that, if we could just hold ourselves back to present rates of virgin resource consumption in a steady-state economy, our problems would be solved. It is important to realize that this is not the case. *We would have an ecological crisis on our hands as we approach the limits of our resources even without any further growth in demand from an increasing population or increasing rates of net per capita consumption. Present* rates of resource consumption are not sustainable for long, because, as indicated above, we are living off the limited biological capital of fossil fuels and of the world's original old-growth forests.

12. Moreover, the environmental problems threatening us and emanating from present levels of resource extraction are severely compounded and exacerbated by two further trends: (1) the net per capita rates of resource consumption, by-product emissions, and waste production continue to trend upwards in industrial nations; and (2) global population continues to grow exponentially, causing resource demands to trend upwards even though in many Third World countries, there has been a per capita decline in resource consumption.[8] Even in the best of circumstances, such escalating trends are

> unsustainable within a finite resource base and habitat. We are quite remote from the best of circumstances. There is no alternative but to scale back our resource demands either voluntarily, with some foresight and planning, or involuntarily, by natural necessity, when the storehouse of valuable minerals and fossil energy becomes bare and equivalent substitutes are impossible to find.

LIVING AS THOUGH WE PLAN TO STAY: THE SUSTAINABLE DEVELOPMENT RESPONSE

Extract resources and consume we must, but not as hitherto. That is the common message of the World Conservation Strategy, *Our Common Future* (the "Brundtland Report"),[9] Canada's Report of the National Task Force on Environment and Economy, and of numerous sustainable development strategies under creation by governments, NGOs and businesses worldwide. This remarkable convergence of opinion and public commitment has focused environmental concerns as a political reality. It has also inspired a good deal of suspicion that the currency of the "sustainable development" slogan masks political and commercial opportunism and the endorsation of practices that are in truth environmentally harmful. On the basis of such suspicions, some environmentalists denounce the use of the slogan "sustainable development" as an oxymoron, a contradiction in terms and an opportunistic exploitation of genuine public concerns about the environment by the business and government interests whose practices and policies are the source of our environmental problems. My own reading of the Brundtland document and the political climate leads me to share the suspicions of these environmental critics, but not therefore to abandon the Brundtland initiative and the "sustainable development" banner.

Our Common Future is the bible of sustainable development, and like the scriptures of religious traditions, a lot of different messages can be read out of it. The one common point of departure appears to be the report's definition of sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (p. 43). One suspects that it achieved its political consensus through compromise, and by offering the upbeat possibility of continued economic growth and development for all, without sufficiently stressing the hard choices imposed by planet Earth's limited carrying capacity. Consider this passage:

> Our report . . . is not a prediction of ever increasing environmental decay, poverty, and hardship in an ever more polluted world among ever decreasing resources. We see instead the possibility for a new era of economic growth, one that must be based on policies that sustain *and expand* the environmental resource base. And we believe such growth to be absolutely essential to relieve the great poverty that is deepening in much of the developing world (p. 1--my emphasis).

It is true that the economic growth envisaged in the report is primarily for the sake of the so-called developing countries, but it is also permissive for the industrial world, subject to the criterion of sustainability. This message has come to be interpreted to mean that while the economies of the poorer nations must grow to satisfy their basic human needs, *we in the more industrialized world must also grow* in order to create the additional wealth needed to save the environment. Growth, as we usually understand it, includes a greater material throughput in the economy from the creation of new products and increased volumes of sales. And so we get absurdities like the recently announced Celgar pulp mill expansion "for the sake of the environment" in Castlegar, B.C.

The Celgar mill, like all pulp and paper operations in B.C., faces a December 31, 1991 deadline to reduce discharges of organochlorines to 2.5 kilograms per tonne of pulp. Their current discharge is 4.2 kilograms per tonne. In order to meet the new standard, Celgar plans to increase mill production from 185,000 to 420,000 tonnes per year. "Wilf Sweeney, general manager of Celgar, said . . . that the expansion is necessary to justify the cost of the environmental control equipment to satisfy government requirements."[10] The absurdity is that the production increase will more than offset the per tonne pollution reduction. As a consequence, once the conversion is complete, the mill will be discharging 35 percent *more* total organochlorines than at present in addition, of course, to a more than doubled rate of harvest from the forests. So much for saving the environment through growth!

What is lacking in this interpretation of "sustainable development," in which everyone looks for material economic growth, is a sufficiently profound recognition of the limits imposed by the finitude of our planet and by the requirements of life. This deficiency in economic theory has been extensively analyzed by economists Nicholas Georgescu-Roegen and Herman Daly.[11] Daly accused his economist colleagues of a two-fold confusion: the intermediate expressions of value found in the market ("demand") were treated as an ultimate value foundation for the determination of social policy and the biophysical limits of a finite planet were ignored in the naive faith that whenever a particular resource became scarce, another substitute could be found. We might label these theoretical flaws as *the fallacy of misplaced ultimacy* and *the fallacy of unlimited growth through resource substitution.*

Recognizing that there are biological and physical limits to growth which preclude the sustainability of an undifferentiated and increasing demand for goods, Herman Daly, in a September 1989 lecture at the University of Winnipeg, drew a distinction between *development* as an improvement in the quality of life, and *growth,* which implies a physical accretion to the economy. Sustainable growth is, then, a contradiction in terms, an impossibility within a finite system. The world's economies face ultimate limits of sustainable scale or total resource use (also expressible as the population times the per capita

resource use). This leads to his definition of sustainable development as a process in which qualitative development is prolonged while growth is restricted within a sustainable scale of the economy.

What are these limits to a sustainable scale for the economy? According to Daly, one limit is the assimilative capacity of ecosystems to absorb and process wastes without degenerating. A second limit, pertaining to harvest rates of renewable resources, is the level of maximum sustained yield, in which regeneration rates equal harvest rates. A third limit, pertaining to the use of non-renewable resources, is the rate at which renewable substitutes for the non-renewable resources can be created. For example, in the case of a non-renewable resource like petroleum, a sufficient proportion of the net return should be invested in renewable conservation measures and alternate energy sources to produce a supply of the latter adequate to replace the former as it runs out.

I am heartened by Herman Daly's analyses as a contribution to the revision of economic theory and find them illuminating and helpful. However, even with his improvements, I am still distrustful of the capacity of present economic theory to express both the natural constraints on development and the totality of values at stake by which our economic activities are measured. Consequently, I think it is more perspicuous to summarize these values and constraints in the form of two guiding principles for an ecologically sound theory of sustainable development, rather than a single formula. I call these *The Biosphere Preservation Principle* and *The Resource Stewardship Principle*. We must, I think, make preservation and stewardship the conjoint principles of a sustainable conserver society. These will be elaborated in the next section.

WHY CONSERVE AND RECYCLE?
THE PRINCIPLES OF PRESERVATION AND STEWARDSHIP

Recycling is a part of an overall environmental policy which aims to lessen negative impacts on the natural environment, to show respect to other forms of life and to the matrix of life from which we ourselves have arisen, and to sustain into the indefinite future the possibility of a healthy, fulfilled, and morally sensitive human life within a rich biosphere of manifold species and ecological systems. This is a perspective from which all our environmental and economic policies ought to be assessed, whether or not we are able to translate such environmental values into economic values. In the broadest terms, recycling practices should serve the following two objectives:

1. **To preserve intact a viable, flourishing biosphere containing the most extensive and varied natural ecosystems possible (The Biosphere Preservation Principle).**

   This is the most important and ultimate environmental objective for a variety of reasons:

a. The long range viability of human life depends upon the survival and health of the natural systems of which we are an ecological part.

b. Living systems with their myriad species and biochemical compounds and processes are a storehouse of nature's inventions of great utilitarian value. They have created our soils and climates and are the original source of most of the organic materials and varieties that feed, medicate, clothe and fuel us. In destroying portions of this storehouse, we destroy a vast potential wealth of other inventions of nature not yet discovered and appropriated to our needs.

c. The scientific knowledge of our human nature and origins and of the impact of human life on the planet requires a baseline knowledge of natural systems that are largely unaffected by ourselves.

d. Living systems are important not only for the physical sustenance of life but also for the sustenance of many of our deepest values. A love of Canada, for immigrants of the last few centuries and Aboriginals alike, surely includes a love of her landscape and living things. It is a part of the cultural heritage and identity of Canadians to live in a vast wild and beautiful land, and it is the heritage of some, including many of Canada's Aboriginal people, to live close to that land. Religious awe, artistic inspiration and aesthetic delight, adventure, exploration, recreation, wisdom and knowledge--all have grown out of our interactions with the wild natural world. Destroying parts of nature, we destroy important parts of ourselves.

e. Finally, many have concluded that we owe the community of life a profound, even worshipful, respect as the fertile source of our existence and the ambience within which we "live and move and have our being," and that we owe Earth's many creatures and species an ethical regard as fellow-travellers on the adventure of life, co-inhabitants of spaceship Earth, who are marvellous and worthy in their own right and not to be valued solely for their human utilities.

2. **To utilize finite natural resources in the environmentally most efficient ways to sustain human life and human well-being into the indefinite future (The Resource Stewardship Principle).**[12]

The judgment here is that human life can indeed be worthwhile, that it ought to continue on Earth and flourish, and that we ought not to leave future generations a habitat unfit to live in, impoverished of resources, or bleakly deficient in the biological riches described above. This requires proper resource management, lest our inherited natural riches be squandered. The Resource Stewardship Principle restates the Brundtland Report's definition of sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (p. 43).

We are, inevitably, consumers of resources. *Environmental Efficiency* means that the human values we reap from our consumption in the world are achieved at the least possible cost to environmental values and to our continuing resource base. This attention to the manifold values in nature and multiple ways that the natural world is valuable to us--spiritually, materially, and economically--requires a deliberate rejection of earlier views, still influential in economic and political theory, that devalue the natural world. In particular it requires a rejection of the *Economic Value Assumption* that all value is created by human productive and economic activity and added, thereby, to an otherwise valueless natural world. When we focus exclusively on values and costs generated and paid within the market economy, and fail adequately to acknowledge the antecedent riches of our natural heritage and commonwealth, our economic activity becomes terribly and unnecessarily destructive.

The Biosphere Preservation and the Resource Stewardship Principles together prescribe an ethic of respect for nature and for future generations of humankind which, in the words of the *Statement of Principles and Policies* of the Recycling Council of Manitoba, "holds each of us individually and our social institutions collectively responsible for the impact of our lives on the environment." Such environmental principles are an essential elaboration of and supplement to the basic humanistic ethical principles of justice and beneficence for all.

The fact that we have two ultimate principles rather than one for an ecologically sound conserver society could lead to a Meech-like wrangle over how they should fit together and which should take precedence in cases of conflict. In fact, the potential for conflict grows when we add other ethical and social norms and a diversity of cultures and interests into the mix. We have, I think, no single ready formula for resolving such conflict, and indeed many diverse and nuanced resolutions are required at the different levels of theory, policy and practice. The importance of articulating such broad, but sometimes potentially conflicting, principles is that each marks a partial convergence of a range of important values

which, without such articulation, are in danger of becoming trampled on and lost in the fray of policy creation and social and individual practice. When they are articulated with an understanding of the range of considerations that stand behind them, they can serve both as banners for rallying the social will and basic standards for evaluating policy and practice.[13]

Because there are two standards, there is the potential for tension and conflict between them, but not inevitably so. Indeed, the principles of preservation and stewardship complement one another extensively. They diverge only at the point where the sustenance of human life and well-being sanctioned by the stewardship principle might authorize a level of utilization that is destructive of some, but not all, of the natural diversity that the preservation principle protects. Taken together, they support whatever policies and practices could fulfil them both. That is why, in the current climate of opinion in which many of the values that these principles support have taken root, it is relatively easy to sell the idea of waste reduction and recycling as a desideratum. Without immediately challenging our current levels of material consumption, recycling, rightly pursued, directly promotes the environmental efficiency of our resource consumption, i.e., we can conserve our resources significantly without making significant sacrifices in material well-being. With recycling, a given quantity of virgin resource extraction or of waste production stretches further in the creation of human goods, thereby lessening our demands on natural systems and achieving greater human value at lesser environmental cost. Through recycling, we can have our cake and eat it too. However it is important to imbed recycling in a larger ecological perspective, since whatever gains might be achieved in fulfilling the principles of preservation and stewardship could soon be lost through the demands created by increased levels of material consumption and increased population pressures.

If sustainability is to be achieved, the "development" that is called for must include a significant net reduction in global per capita and total virgin resource demands.[14] Thus assiduous, deliberate conservation and recycling strategies are essential components of a population and an economy the size of ours that would attempt sustainability. Our economy is like a giant leaky pipeline that sucks up vast resources at the front end and discharges growing mounds of waste at the rear, while spraying escaped emissions at large in the environment creating havoc in all directions. By plugging the leaks and adding some loops to the pipeline, we can greatly reduce the environmental degradation at both ends and alongside the pipe, while continuing to draw genuine human benefits from the material flow within it. Even so, we ought not to mistake the material flow for the benefits, but should continue to search for ways to lessen the volume of flow needed for a given level of genuine human well-being. Conservation and recycling strategies are principal pathways to the twin goals of ecological preservation and environmental efficiency in the utilization of resources to achieve genuine human fulfilment.

CONSERVATION AND RECYCLING POLICY GUIDELINES

Recycling proposals and practices, as indeed all of our activities, need to be assessed in the light of the Biosphere Preservation and the Resource Stewardship Principles. Not every recycling practice makes ecological sense. For example, it would not be environmentally benign or helpful to hop into the family van and drive across town on a special trip to the beer vendor for the sole purpose of returning a six-pack of glass beer bottles. The silica in the glass bottles is a relatively plentiful resource in comparison with the gasoline expended (with its attendant atmospheric emissions) to move a heavy vehicle several kilometres. A lesson from this example is that recycling practices need to be incorporated into our normal round of individual and collective activities, and the whole evaluated in terms of our ultimate environmental goals. Reflection on the practicalities of implementing the overarching principles of Biosphere Preservation and Resource Stewardship suggests a number of further guidelines and clarifications. In this section, I merely append a list of such maxims garnered from conservation and recycling literature and discussions, and grouped under the objectives of establishing a sustainable trajectory for the economy, minimizing waste, practising the "4 Rs" of recycling, protecting human health and the environment, and designing for sustainability.

■ ESTABLISH A SUSTAINABLE TRAJECTORY FOR THE ECONOMY

1. Reduce the consumption of all material resources, substitute renewable for non-renewable resources where possible, and conserve non-renewable resources for those significant uses for which substitutes are hard to find.
2. Keep the utilization of renewable resources within the actual rates of renewal for those resources and ease the impact of renewable resource harvesting on the environment.
3. Invest in sustainability. An ever-increasing portion of the returns on unsustainable exploitation of natural resources should be invested in a conversion to more sustainable substitutes.
4. Purchase for sustainability; buy, and promote markets for, products with high recycled content in preference to products made of virgin materials.

■ MINIMIZE WASTE

5. Entropy breeds waste.

Entropy is the amount of disorder, dissipation, and lack of differentiation in a system. For example, a hot coffee cup and the cooler air surrounding it are sharply differentiated in temperature when the cup is first poured (a low entropy state), but after the heat dissipates for a couple of hours they are

virtually the same in temperature (a high entropy state). Recycling is most feasible when different materials, and different grades of materials, are kept distinct or are easily separated. Once they are mixed, a lot of work, processing, and energy goes into separating them into a usable form again, or else the recycled product is of a lower grade because it is contaminated with impurities. We can never totally eliminate the general movement from order to disorder and from concentrated, differentiated resources and energy to dissipated forms, but we can slow it down.

6. **Don't confuse discards with waste.**

We should distinguish between what we discard and what we waste. Discards are not waste until wasted, i.e., converted into a form so as no longer to be further utilizable either as-is or as a resource in the manufacture of something else. We have acquired the unfortunate habit and practice of thinking of most of our discards as wastes rather than as re-utilizable resources and so we waste them. Resources are wasted to the extent that their maximum utilizable value is reduced through degradation and mixing with contaminants. That is what happens when we junk our discards into a composite mash of garbage instead of disposing of them through a recycling scheme. Resources are also wasted when the value of the use to which they are put is much less than the many values they might have had if not so used. Cutting millenia-old trees and destroying the ecosystems of the Queen Charlotte Islands to create disposable diapers (or indeed for any other conceivable use) is a waste.

7. **Maximal recycling requires that we establish efficient and effective recovery and collection systems for recyclables. This must occur:**

   a. **within each particular business operation** by reusing and recycling materials from the flow of discards from its primary processing;

   b. **within households**, e.g., saving materials reused within the home and composting food and yard wastes within the backyard; and

   c. **within society at large** as we collect from households and businesses materials which they cannot recycle themselves but which other individuals and industries can utilize.

■ PRACTISE THE FOUR Rs OF RECYCLING

The label "recycling" is used as a shorthand for a series of related strategies which have the combined objectives of resource conservation and waste reduction. As a rule of thumb, the stewardship and environmental objectives will best be met if we apply the strategies in the following order:[15]

8. ***Reduce*** **the utilization of resources and production of wastes in the production of beneficial human goods.**

The amount of waste we produce is a partial index of the extent to which we waste our resources. It is less likely to be an accurate index of the value received from the goods produced, since the production and consumption of the goods might be extremely inefficient resource utilization, i.e., entail huge expenditures of natural resources with little return in human fulfilment and well-being. Printing a piece of paper on two sides instead of one communicates the same information, but uses less resource and produces less waste than using two single sheets for the same message.

9. ***Reuse*** **items where possible, rather than acquiring new ones or scrapping and remanufacturing the old ones.**

Common examples of item reuse are refillable pop and beer bottles, hand-me-down clothes, goods acquired at garage sales, and taking one's grocery bags back to the store to use on the next shopping trip. Reuse is normally preferable to scrapping and remanufacture because, although the material incorporated in the reused and remanufactured items may be the same, generally a lot more energy is expended and environmental emissions produced in remanufacturing processes than in reusing the original items.

10. ***Recycle***, **where possible, what no longer can be reused.**
11. ***Recover*** **useful products or energy through material transformations of items that can no longer be recycled in their present material composition.**

■ PROTECT HUMAN HEALTH AND THE ENVIRONMENT

12. **Reduce harmful emissions from resource extraction, processing, consumption, and waste disposal as much as possible.**
13. **Protect human health and the environment from hazardous materials by elimination, substitution, separate handling, and proper design and management.**

■ DESIGN, PLAN AND STRUCTURE FOR SUSTAINABILITY

14. **Design both individual goods and systems of distribution and collection for conservation and recycling.**

At the level of individual products, design can aim to use material less wastefully, incorporate recycled material content, and replace unrecyclable multi-material products (e.g., bi-metal cans or paper labels and metal tops on plastic bottles) with uniform material products (can tops and sides of one metal, plastic labels and tops on plastic bottles). Products can also be designed to be more durable, requiring less frequent replacement, and to be reusable, repairable, and remanufacturable, and standardized to permit common systems of recycling.[16]

Design also enters at a systems level. Transportation systems can be designed to deliver goods and backhaul recyclables. Integrated waste management at provincial, city, regional and municipal levels can reduce the waste load and environmental stress at dumps and landfills by diverting materials into recycling pathways. A municipal garbage collection and transfer system can be combined with a system to recover and sort recyclable materials.[17]

15. **Generators of potential waste and pollutants (i.e., both producers and consumers of products) should assume responsibility (directly or through payment to other agencies) for the safe, sustainable disposal of their wastes, preferably by redirection through recycling pathways.**

16. **Restructure government regulations, incentives and disincentives to promote conservation and recycling.**

We currently live in a society that handsomely subsidizes the exploitation and waste of natural resources. There is no charge for garbage disposal to city residents in Manitoba and only a nominal tipping fee for larger waste producers. The cost is borne by all. There are many incentives for resource extraction ranging from low stumpage fees, insufficient reforestation requirements, lax pollution regulations and enforcement for resource industries, resource depletion allowances, and investment subsidies for resource industries.[18]

When we get truly serious about conservation and recycling, these incentives can all be turned around to favour conservation and penalize waste. Under a different regime that rewards conservation, recycling and waste reduction efforts, research, ingenuity, capital investments and labour will be committed to carry us ever further in that direction.

17. **Restructure government priorities, departments, and agencies to reflect a central and pervasive commitment to conservation and recycling objectives.**

BARRIERS TO CONSERVATION, WASTE REDUCTION AND RECYCLING

The above guidelines for recycling are not radical or novel, and they flow from principles of conservation and sustainability to which, at least nominally, many subscribe. Why, then, is the existence of a conserver society a wish or a plan for the future rather than a reality of the present? Indeed, why are we in many ways moving in the opposite direction with more trash and energy consumption today than a decade ago? There are obviously barriers and counter-trends which any sound conservation and recycling policy must take into account. Some of these barriers may be intrinsic to the processes of recycling themselves, but much more fundamental, I think, are those that rest on distorted valuations that

are reflected in the economy. Until the distorted economic valuations are corrected, we will not know how far we can go in addressing problems that may be inherent in recycling activities themselves.

In the earlier discussion of the Resource Stewardship Principle, I introduced the notion of *Environmental Efficiency*, which directs that our human values be realized at the least possible cost to our continuing resource base and to the multiplicity of environmental values that rest on the continued existence of intact, extensive, thriving, diverse natural ecosystems. Environmental efficiency is a standard independent of any notion of economic efficiency resting on the *Economic Value Assumption* that all value is generated by human economic activity, whether it be labour, market behaviour, managerial or intellectual skills, or the assemblage of capital. Under that assumption, natural systems and natural resources are devalued. This is not to say that economic theory is inevitably fated to make assumptions that devalue or undervalue our natural heritage, but only that we must stand ready to correct or constrain it, if it does. Otherwise, the valuations of natural resources and natural ecosystems in our economic reckoning become terribly distorted.[19]

My thesis is that we have generated an economic system both locally and internationally that originated in perceptions, beliefs, habits, and practices which devalued natural resources and ecosystems. More recently, we have been in the process of altering our perceptions and beliefs to include a new, more encompassing, and higher evaluation of our natural heritage and a greater appreciation of its vulnerability and the hidden costs of environmental negligence. However, these altered perceptions and beliefs have yet to work themselves out in our individual and collective lives, and in economic and political theory and practice. Although our political representatives have subscribed in principle to a new economic order that recognizes the importance of environmental preservation and a sustainable economy, they have been exceedingly vague about the shape and specific requirements of an altered economy and so drifted with the momentum of the old economy.

The old economy is formidably entrenched in a variety of its components and expressions. It is found in:

a. The consumer habits of North Americans after centuries of growth fuelled by exploitation of an extensive North American (and global) resource base and adequate room for waste disposal.

b. The heavy investments and economic and political power of virgin resource industries.

c. The contrasting more marginal status of recycling industries, which operate on a smaller scale, with less vertical integration and capital investment, than the virgin resource industries. All commodity markets face large fluctuations in demand and price for their

goods. The recycling industry seems to face greater fluctuations and to be more vulnerable to those fluctuations than the virgin resource industries.

d. Government investment incentives and resource-depletion allowances that encourage virgin resource exploitation.

e. The desire of governments to preserve jobs in resource-based communities.

f. Increasing costs of labour which lead to the conclusion that it is economically inefficient to conduct labour-intensive recycling operations except by economically marginalized sheltered workshops and volunteer labour.

g. Short-term economic perspectives which heavily discount the future, e.g., using a renewable resource such as timber as a cash cow without sufficient investment in reforestation, which is an immediate cost with a very long-term payoff.

h. Subsidizing polluters and waste producers by failing to factor short- and long-term environmental damages and the costs of monitoring and remedying such harms into the costs of production and by failing to include the more remote environmental, monitoring and land acquisition costs into current landfill disposal.

i. Differential favouring of virgin resource extraction over recycled resource extraction by:

- the aforementioned tax incentives for virgin resource extractors, but not for recyclers;
- subsidies to develop new oil fields (e.g., for Hibernia), but not to oil re-refiners to recycle oil;
- subsidies to Inco, Hudson Bay Mining and Smelting, and other virgin resource extractors for pollution controls, but not to recycled materials companies with similar problems.
- stricter environmental standards and enforcement of standards for recyclers (who are normally near urban centres) than for virgin resource extractors (who are normally remote from urban centres and distribute their pollutants more widely).

j. The growth of convenience products (e.g., disposable diapers, plates, cups, etc.), for which the convenience lies in immediate disposability, without further care for either the ultimate disposition of the used product or the environmental costs of the resources so briefly and voluminously consumed.

k. Growth in world trade based on the old economics, which undervalues diminishing resources on the market and takes products a long distance from their point of

manufacture, so that reuse or remanufacture of those products by the same firm that produced them originally becomes difficult or impossible.

No one wants to kill the goose that lays the golden eggs. Despite its imperfections, the old economy has yielded (until recently) rising levels of personal wealth and extensive support of health, education, culture and welfare--at least for the more fortunate in industrial nations. Understandably there is a reluctance to dismantle what has proven so beneficial to us in so many ways. But now we have begun to realize that it is our natural heritage and resource base which is the goose that lays the golden eggs. The economy is the gander that can produce nothing by itself but is in danger of killing the goose by ravaging it too aggressively. That fate is a real and frightening threat when we consider that even most of us who enjoy the fruits of industrial society expect more, and the world's poor, in our own country and elsewhere hope to catch up. At the same time the world's population has recently been growing at close to 2 percent, which will double it every 35 years.[20] This exponential growth in demands upon our biosphere and resource base is clearly unsustainable for long.

In addition to the economic obstacles to recycling within the distorted valuations of the old economy, which are stacked in favour of virgin resource extraction, there are other, related obstacles that must be addressed:

a. There is concern about health risks from recycled products, e.g., the fear of finding a mouse in a beer bottle, and the one-time use of needles and other instruments and materials in hospitals rather than resterilization. More generally, there is a concern that quality control is less rigorous for recycled processes and products, which may make them less attractive to consumers.

b. There is concern about health risks from recycling operations, e.g., lead and hydrogen sulfide in the soil and air from battery recycling operations.

c. In general there is a lack of co-ordinated systems, infrastructure and standards for recycling sufficient to overcome the entropy problem that recycling faces as it tries to recover materials that are widely distributed and frequently contaminated by admixture with other materials.

d. Recycling is particularly sensitive to transportation costs, especially when dealing in high volume commodities of low market value. Recycling involves a double transportation cost to move materials from collection points to the points of processing and remanufacture and to move finished products back to consumers. Of course, manufacture from virgin raw materials also requires transport of the raw material to the points of processing and manufacture, but in this case the raw material is more likely to be bulked from one source

rather than drawn together from many sources. In a regime with more recycling, local industries (e.g., a local bottler) will have an edge over more remote suppliers because of the lower round-trip transportation costs.

THE ELEMENTS OF A RECYCLING POLICY

The preceding discussion of general environmental principles and conservation and recycling guidelines, and the recognition of various barriers to recycling, provide the basis for making policy recommendations. Concrete, practical policy proposals should tailor the general principles and guidelines to local circumstances and address the various barriers to conservation and recycling. As a rule of thumb, we should look for the most successful features of programs in other jurisdictions and seek to implement them locally. The burden of proof will then rest with critics to show why not. There is room for differences in judgment in such applications and we should expect to learn from our own and others' experience and be able to adjust to changing circumstances. But we should always keep in mind the ultimate objectives of establishing a sustainable set of practices, while conserving resources and preserving biosphere integrity as a basis for evaluating these and anyone else's proposals.

A certain amount of recycling will occur without the benefit of any deliberate social policy either because of the consciences of individual citizens or because there are sufficient short-term profits to be realized. These efforts are important, but grossly insufficient in relation to the magnitude of the problems of creating a more sustainable and environmentally benign economy. We know that much more is feasible. Higher rates of resource conservation and recycling require the deliberate commitment of citizens and their governments and the establishment of a comprehensive policy. This does not mean that government does it all, but it does mean that government takes the initiative of co-ordinating efforts and providing the right regulatory, political and economic regime within which recycling and conservation efforts can prosper.

Our task, then, is to identify the elements of a social policy that would embody a whole-hearted political and social commitment to conservation and recycling goals. I have identified in a generic way nine such elements. Such a policy should include: (1) an explicit commitment to fundamental guiding principles and goals; (2) an assessment capability to keep the public and government informed of progress (or its absence) in meeting those goals; (3) one or more agencies to oversee and facilitate the implementation of appropriate conservation and recycling practices; (4) the creation of collection systems and markets for recyclables; (5) the deployment of effective incentives and disincentives to steer commodities to recycling pathways; (6) the formulation and enforcement of protective environmental regulations; (7) public education, information, and awareness programs; (8) appropriate research and

professional education; and (9) a policy development process that would realize these elements. I shall illustrate these briefly from my own 1989 report for the Manitoba NDP Environmental Task Force and from the just-issued draft recommendations of a provincial Recycling Action Committee (RAC) appointed by Manitoba's Environment Minister and chaired by my colleague Robert Fenton of the Economics Department, University of Winnipeg.[21]

1. **An explicit commitment to fundamental guiding principles and goals.**

   NDP report: Committed to the Biosphere Preservation and Resource Stewardship principles plus a goal of 75 percent reduction in residual wastes by the year 2000 and eventual zero waste.

   RAC report: Committed to a 50 percent reduction in residual wastes by 2000 and continuing reductions after that. Philosophically based on a concept of sustainable economic development which includes "materials and energy efficiency, wise use of natural resources, conservation and stewardship."[22]

2. **An assessment capability to keep the public and government informed of progress (or its absence) in meeting those goals.**

   NDP report: Calls for the establishment of an office of an independent Environmental Auditor who in annual state of the environment reports will assess the degree of progress in achieving conservation and waste reduction objectives as well as other environmental objectives.

   RAC report: The monitoring of all aspects of the waste reduction plans and targets is the responsibility of the Department of Environment.

3. **One or more agencies to oversee and facilitate the implementation of appropriate conservation and recycling practices.**

   NDP report: Calls for the creation of a crown corporation, the Manitoba Conservation, Recycling and Disposal Corporation ("Recycle Corp."), to co-ordinate and implement the provincial conservation and recycling strategy.

   RAC report: Identifies distributors of goods as the primary responsible agents for developing and implementing waste reduction action plans for the goods they sell. The Department of Environment will monitor their activities and adjust penalties and incentives.

4. **The creation of collection systems and markets for recyclables.**

   NDP report: Recommends curbside collections of recyclables to supplement garbage collection in urban areas with permanent multi-material depots in other areas.

RAC report: Leaves collection systems the responsibility of distributors while encouraging them to form partnerships with community groups.

5. **The deployment of effective incentives and disincentives to steer commodities to recycling pathways.**

   NDP report: The Province and Municipalities are encouraged to deploy appropriate incentives and disincentives to make it economically advantageous to conserve and disadvantageous to waste. A deposit/refund system for beverage containers is specifically recommended to encourage container reuse over material recycling.

   RAC report: Municipalities are encouraged to charge by volume for garbage services. Provincial disincentives may be implemented for those commodities that fail to meet their waste reduction targets.

6. **The formulation and enforcement of protective environmental regulations.**

   NDP report: Calls for the Province to establish a Waste Management Working Group to identify risks and recommend optimal waste management that encompasses both conservation and health and environmental protection objectives.

   RAC report: Not within its mandate, but makes recommendations for co-ordinating waste management with recycling policies.

7. **Public education, information, and awareness programs.**

   NDP report: The Department of Education shall be responsible for school programs. Recycle Corp. and various stakeholder groups shall carry on public education and information programs.

   RAC report: Manitoba Environment shall work with stakeholders and the Department of Education to these ends.

8. **Appropriate research and professional education.**

   NDP report: The Province shall support this.

   RAC report: The Province shall support this and designate an existing agency to co-ordinate product and process development.

9. **A policy development process to realize these elements.**

   NDP report: The Province shall develop a strategy in consultation with various stakeholders. RAC was endorsed as an appropriate vehicle for this, but other working groups were recommended to develop specific facets of the policy.

   RAC report: RAC has developed a provincial policy framework which still needs to be fleshed out through continuing consultations and negotiations.

NOTES

1. The World Resources Institute and the International Institute for Environment and Development, *World Resources 1986* (New York: Basic Books, 1986), p. 103.

2. Dennis Bueckert, "Canadians most wasteful: Bouchard cites new stats," *Winnipeg Sun*, 12 May 1989.

3. This important point was made by the economist Nicholas Georgescu-Roegen in *The Entropy Law and the Economic Process* (Cambridge, MA: Harvard University Press, 1971). It is also a cornerstone of Herman Daly's analysis in *Steady-State Economics: The Economics of Biophysical Equilibrium and Moral Growth* (San Francisco: W.H. Freeman, 1977), and (with John Cobb), *For the Common Good: Redirecting the Economy Toward Community, the Environment, and a Sustainable Future* (Boston: Beacon Press, 1989). I am, throughout this paper, particularly indebted to Herman Daly's work.

4. John Gever, Robert Kaufmann, David Skole and Charles Vorosmarty, *Beyond Oil: The Threat to Food and Fuel in the Coming Decades* (Cambridge, MA: Ballinger, 1986). Cited in Daly and Cobb, p. 407.

5. Paul Ehrlich in a speech given at the University of Manitoba in November 1985.

6. Wes Jackson, "Food as Fuel: A Prophecy of Collapse," in *New Roots for Agriculture* (Lincoln, NE: University of Nebraska Press, 1985).

7. D.H. Meadows, et al., *The Limits to Growth* (New York: Universe Books, 1972).

8. *World Resources 1986*.

9. A report to the United Nations from the World Commission on Environment and Development chaired by Madame Go Harlem Brundtland, *Our Common Future* (Oxford: Oxford University Press, 1987).

10. Karen Howlett, "Celgar pulp mill consortium planning to double its capacity," *Globe and Mail*, 5 October 1989, p. B3.

11. See Georgescu-Roegen, *The Entropy Law* (Cambridge, MA: Harvard University Press, 1971); Daly, *Steady-State Economics*; Daly and Cobb, *For the Common Good*.

12. A steward is an employee charged with managing supplies and resources for the provisioning of others. A hierarchical religious interpretation of stewardship might view the steward as a servant of God, who must conserve, invest and allocate resources as God directs (see Luke 12:42-48). We use the model here in its broadly humanistic interpretation to mean that those who can affect resource allocation and utilization have an obligation to do so in the service of the whole of humanity and of human posterity.

13. In these respects, they fit the description that Nicholas Rescher gives to values: "A value represents a slogan capable of providing for the rationalization of action by encapsulating a positive attitude toward a purportedly beneficial state of affairs" (*Introduction to Value Theory* [Englewood Cliffs, NJ: Prentice-Hall, 1969], p. 9).

14. The Brundtland report does recommend a permitted increase in per capita resource extraction for Third World countries to achieve a reasonable standard of living, although at the same time they must reduce their populations to sustainable levels.

15. A good description of these strategies may be found in *Recycling of Waste in Alberta: Technical Report and Recommendations*

16. Task Force on Waste Management, *Integrated Waste Management System--Policy and Implementation Issues* (California State Senate, February 1989).

17. Mary Lou Van Deventer, "Marin recycles 30% at $9.5-million transfer station," in *Materials Recovery Report* (November 1987).

18. Calvin Webb, *Economic Barriers to Recycling* (Edmonton: Alberta Environment, 1985).

19. Webb (*Economic Barriers*) documents many of these distortions and Daly (*Steady-State Economics*) and Daly and Cobb (*For the Common Good*) provide a critique and theoretical alternative.

20. *World Resources 1986.*

21. The interested reader may wish to compare these recommendations with comparable sets produced in Alberta and B.C. See *Recycling of Waste in Alberta: Summary Report and Recommendations* (1987) and *Recycling of Waste in Alberta: Technical Report and Recommendations* (1987), available from Alberta Environment and *The Recycling Council of British Columbia's Response to the B.C. Ministry of Environment's Discussion Paper: The Provincial Role in Municipal Solid Waste Management* (1988). I am deeply indebted to these sources for many of the ideas in my Task Force Report. However, I am inclined to push further with my recommendations and advocate a social commitment to conservation and recycling rather than a strictly economic determination of the right level of recycling, even with a so-called "level playing field." The systematic bias of the old economics is too strong; we need "affirmative action" to correct for its wasteful impetus.

22. *Conserving Our Future: A Draft Recycling Strategy for the 90s* (Recycling Action Committee and Manitoba Environment, 1990), p. 30.

THE RIVERS OF DOWNTOWN WINNIPEG: AN ENVIRONMENTAL ASSESSMENT

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INTRODUCTION

The popular catch-phrase "Sustainable Development" implies, among other things, economic development without significant detriment to natural processes in the environment. When this interpretation is applied to river quality and urbanization, the implication is simple: no matter what the uses, whether they be extractive or additive, the net effect should not alter natural processes to the detriment of the river and its immediate environs. Secondarily, if alteration is unavoidable, then every step should be taken to ensure that the effects are minimised and that the advantages of alteration clearly outweigh the deficits.

With this philosophy in mind, the following study examines first the uses of the Red and Assiniboine Rivers, and secondly the effects of these uses upon the river quality within the city.

EXTRACTIVE USES

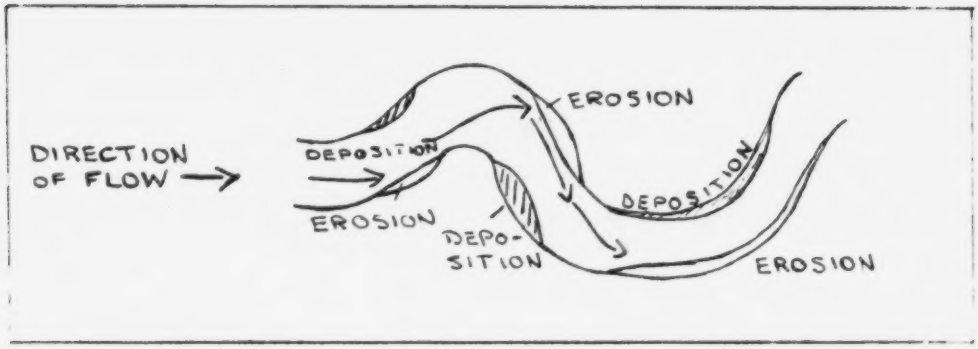
One of the most important natural processes in any river corridor is the direct relationship between channel flow and channel form. Any seasonal reduction in flow from extractive uses will modify the rates of both channel deposition and erosion. A similar reduction in aeration and effluent breakdown will also occur during periods of reduced flow.

Both rivers are used for drinking water supply, irrigation, and in the case of the Assiniboine, the flow can be further disrupted by flood diversion and diversion for the purposes of hydro-electric power generation.

ADDITIVE USES

Both the Red and the Assiniboine are used for liquid sewage disposal, industrial effluent dilution, contaminated snow dumping, and both rivers receive the trace contaminants in natural run-off from agricultural chemicals used within the province. Although laws exist regarding the quality and treatment of effluent before discharge into the two rivers, these laws have never been rigorously enforced, and problems occur as a result.

Figure 1


DIRECTION
OF FLOW
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EROSION
DEPOSITION
EROSION

ADDITIONAL USES

The rivers are also used for navigation, recreational boating, water sports including sport fishing, and, as riverbank real estate values indicate, to enhance the scenery and aesthetics of an otherwise monotonous prairie landscape.

EFFECTS OF WATER EXTRACTION

There is an inverse relationship between extractive demand and water flow which guarantees that the greatest demands will always coincide with minimum flows. This relationship greatly increases the consequences of extraction, which can be assessed in two ways.

As previously stated, there is a direct relationship between channel flow and channel form to the extent that river flows effectively control the rate of channel deposition and erosion. In the Assiniboine River water is extracted: by the town of Portage la Prairie for drinking water; by pumping into the La Salle River to fulfil irrigation needs; and, in the particularly low flows of 1989, water was diverted into Lake Manitoba to reach Manitoba Hydro's Northern generating stations more quickly to enable the utility to fulfil its profitable summer power exports. In the Red River, the effects of extraction are not observable within the city limits because of the Lockport Dam, which was built to keep the river navigable from Lake Winnipeg to the city; the dam maintains an artificially high water level throughout the summer months.

The major effects of extraction are clearly more noticeable in the Assiniboine River. Extremely low flows during the summer months expose the mudbanks, which traditionally develop on the inside of the river meanders. Exposure in turn leads to vegetation which then traps more sediment, and the net result is a more forceful diversion of spring flows onto the opposing bank and much greater risk of erosion (Figure 1).

The city does not monitor bank erosion in sufficient detail fully to determine the net effect of this process, and further research is required to evaluate the relationship between low flows, mudbank deposition and consequent rates of erosion.

Nineteen eighty-nine was a perfect year to evaluate the second aspect of water extraction and low river flows. In 1989, the Assiniboine River had flow rates well under 3 m^3 a second at Headingley, and between Headingley and the Perimeter Highway we have the influx of treated sewage from the West End Water Pollution Control Centre (Charleswood Lagoon System). The organic content of the treated effluent (B.O.D.)[1] averaged 12 mg/L during the month of June 1989 as compared with an acceptable standard in Ontario of 4 mg/L for natural waters, and 2 to 3 mg/L in Europe. The city relies upon the natural dilution and aeration of the river to dilute the effluent and reduce the BOD to acceptable levels. Low

summer flows are significantly less efficient in accomplishing this goal, and since the ability of water to contain O_2 is inversely related to temperature, the river is least capable of handling effluent during the hotter summer months.

EFFECTS OF ADDITIVE USES

Both rivers receive a variety of effluents ranging from the city's sewage to industrial and agricultural wastes. Concern has been expressed throughout the world with regard to PCBs (polychlorinatedbiphenals), dioxin, pesticide wastes and high levels of sewage and related pathogens in natural waters. Winnipeggers are fortunate in that our city has made special efforts to monitor the state of the Assiniboine and Red Rivers so that even though the rivers are being polluted, we at least know what those pollutants are, where the sources are, and what steps and costs are necessary to improve the situation.

All the evidence to date suggests that levels of PCBs (maximum safe level 2 mg/L) are found only in trace amounts, similarly detailed studies show no significant concentration of dioxin or of eleven different pesticide residues in any fish species or shellfish in the two rivers.

It would appear that the problems facing the rivers from additives are restricted to the following areas:

- high levels of treated and untreated sewage (especially following wet weather events, where 50 percent of the city's sewers are also storm sewers);
- leaded gasoline residues in snow dump sediment; and
- occasional accidental spills of toxins from local industries.

SEWAGE

Sewage levels in the Red and the Assiniboine Rivers are comparable to levels in other rivers flowing through urban centres in Canada. The city's own studies show BOD levels as high as 125 from wet weather overflows of untreated sewage. Suspended solids as high as 370 mg/L and coliform bacteria as high as $8.5 * 10^6$/100 mL of water. It is especially noteworthy that wet weather overflows are responsible for 71 percent of the solids, 33 percent of the BOD overloading, 10 percent of the nitrates, 23 percent of the phosphates and 60 percent of the coliform bacteria levels which occur in the two rivers.

Sewage reaches the rivers from the South End, North End and West End sewage treatment facilities, and the city is in the middle of a $160 million improvement programme which will see the South End plant double its capacity and the West End lagoon system being totally replaced with a more efficient plant. Each plant's effluent is continuously monitored, and from these figures and the downstream values

also sampled, we can determine both the ability of the rivers to handle the volume of sewage and just how long or how far downstream is the effluent diluted to acceptable levels for a natural water body.

Dissolved oxygen (DO) is a good measure of water quality, with fish like trout and salmon demanding 10 to 12 mg/L to survive. A DO level below 5 mg/L is harmful to fish; 3 or less is fatal. Winnipeg's rivers consistently maintain DO levels well above the lower levels, and one can accept that they can handle the BOD levels of the effluent.

An alternative means of assessing the water quality is to determine the level of coliform bacteria. Coliforms are themselves not harmful to humans, but their numbers do indicate the likely level of more harmful pathogens in the effluent (hepatitis, typhoid, polio). Various levels of coliform bacteria are acceptable, depending upon the planned use for the water. For example, domestic consumption requires a level of 0; 200 to 400/100 mL is acceptable for primary recreation (swimming); 1000/100 mL for waterskiing and irrigation. An examination of coliform levels during the favourable warm water months indicates that the coliform count is far greater than the Environment Council's figure of less than 5 percent of the samples per month exceeding 1000/100 mL. For example, Table 1 shows measurements taken at Selkirk, a community which uses Red River water as an emergency drinking water supply.

Table 1 demonstrates the serious consequences of wet weather overloading of the sewers, and with 50 percent of the city served by sewer/storm sewer joint systems, the cost of separation would be in the region of $1 billion. Alternatives include constructing some kind of holding facility, like Chicago's, to retain the run-off and process it after the wet weather event, or, alternatively, to introduce disinfection. The latter alternative is cheap ($8.4 million estimated) and effective. It is the basic method used to keep Winnipeg's drinking water free of coliforms, and also to ensure water quality in the city's public swimming pools.

There is, however, a problem in that chlorine, the least expensive choice, is very toxic to fish. Levels as low as 0.3 mg/L have been shown to destroy taste buds of fish, and slightly higher levels damage the gill mechanisms. Disinfection of the city's sewage outflow would require chlorine levels in the 8 to 12 mg/L range, and this would undoubtedly affect fish species if an accidental release were to occur. Of more concern is the demonstrated chemical reaction between chlorine and organic sewage which releases harmful chemicals into the water.

Table 1

Average Coliform Counts in the Red River at Selkirk, Manitoba

Coliform Count			
5,000/100 mL	exceeded	270 days in the year	
10,000/100 mL	exceeded	62 days in the year	
50,000/100 mL	exceeded	15 days in the year	Wet Weather Events
150,000/100 mL	exceeded	4 days in the year	

SNOW DUMPING

Snow dumps have frequently been located on river banks because the greatest cost in snow removal is trucking the snow to a suitable dump site, and also because the snow melts much faster when submerged by the rising spring flows of the river. Snow dumping is not a desirable use for the riverbanks in the city for a number of reasons. The added weight of snow and sediment can add to an already serious problem of river bank instability; a snow dump in the spring is aesthetically not pleasing to the eye as the debris melts out of the snow; and, perhaps most seriously, it adds to the river a significant quantity of salt- and lead-contaminated sediment from the city streets. A study published in 1983 demonstrated that lead levels in snow dump sediment exceeded the natural levels of lead by a factor of 10, and further confirmed that algal leaching can break the bond between the lead and the sediment and introduce it into the food chain. An earlier study also confirmed that a snow dump in the river could divert the current onto the opposing banks, further increasing the erosion rate. The city has reduced the number of riverbank snow dumps in use and will eventually eliminate this practice. The taxpayer will, however, have to foot the bill for the added trucking expenses.

OCCASIONAL SPILLS

All rivers are subject to the risks of human error in industry and spills of toxic substances are inevitable. Winnipeg has suffered from a molasses spill in North Dakota which removed O_2 from the water, as well as from local oil and gasoline spills. As long as storm sewers are accessible to the general public, all manner of wastes can clandestinely be discarded in this way. However, the absence of heavy industry in Winnipeg makes this far less of a problem than in other major North American cities.

SUMMARY

The Red and Assiniboine Rivers are aesthetically the most beautiful natural feature within the city limits. At present, sewage content of the water makes it unsuitable for swimming and for waterskiing. The water also contains small quantities of a number of chemicals which warrant further study. It should, however, be noted that the visual quality of the two rivers is a result of natural sediment load, and removal of the coliform bacteria would not change the visual character of the river one iota. In other words it would be safe to swim with the coliform removed, but the water would still retain its muddy colour.

There is, however, clear evidence that the city must continue its efforts to clean up the rivers of the sewage, which, if allowed to continue at present levels, will not only contaminate the river water, but also add to the already contaminated southern basin of Lake Winnipeg. Any loss of tourism in this area would be a serious blow to the region's economy. It would be wise to recognise that people's perception

of reality is often more real to them than reality itself. The two rivers' natural sediment load already gives the impression of a polluted stream, and it is therefore even more essential that the city do everything in its power to ensure that Winnipeg does not convert that impression into reality.

NOTES

1. = BOD (Biochemical Oxygen Demand), the amount of O_2 required to break down organic effluent.

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SUSTAINABLE DEVELOPMENT AND URBAN POLICY IN WINNIPEG

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INTRODUCTION

The late Dr. Lawrence J. Peter, best known for the famous "Peter Principle," provided an appropriate introduction to the topic of these seminars in his bestseller of 1975, *The Peter Plan*.[1] That book opens with the author's return to the mythical metropolis where he grew up, "Excelsior City." (A footnote indicates that Dr. Peter's actually was from Vancouver, though he later lived in many American cities and settled in California).[2] Succeeding paragraphs describe how the leaders and citizens of "Excelsior City" realized the impacts on themselves and the environment of their continual pursuit of "bigger and better" urban growth. By the year of the author's return (1990!), they have transformed "Excelsior City" into an exciting laboratory of urban sustainable development projects and policies, which Peter describes in some detail. While it is not within the scope of this paper to examine further Dr. Peter's prescient vision of a futuristic sustainable city, we should note two of the many quotations in the book. The first quotation is attributed to John Maynard Keynes: "Ideas shape the course of history." The second, which is closely related to it, is attributed to Victor Hugo: "There is one thing stronger than all the armies of the world: and that is an idea whose time has come" (Peter, 1977, pp. 84, 160). I suggest to you that it is appropriate to apply these quotations to sustainable development with the basic question: "Is sustainable development an idea whose time has come; is it an idea that will shape the course of urban public policymaking at the local, provincial, national, and global levels of public affairs?"[3] Or is sustainable development just another buzz-word, a political euphemism for "business as usual?"[4]

This paper, of course, addresses only one small part of this larger question: the relationship of sustainable development to urban policymaking, and particularly to the existing situation and potential opportunities in Winnipeg. The first major section explores the linkage between sustainable development as a general concept and patterns of urban policymaking. The second major section examines the current status of sustainable development in provincial and local urban policymaking here in Winnipeg, and suggests what further actions can and should be taken. The last section returns to the basic question of the value and future of the idea of sustainable development, as well as considering the need for local action.

THE CHALLENGE OF RELATING SUSTAINABLE DEVELOPMENT TO URBAN POLICYMAKING

The purpose of this section is to provide a more general context for the primary research regarding the current Winnipeg situation, reported in the next section. This discussion of the relevant context will not include a comprehensive review of the historical evolution of sustainable development concepts and practices, which can be found elsewhere in the literature (Simon, 1989; Tolba, 1987), as well as in other papers included in this volume. However, from the outset, it must be recognized that the concept of sustainability, as it was popularized by the World Conservation Strategy in 1980, was not focused on urban phenomena. Rather, the origins and early development of the concept were rooted in attempts to conserve biospheric resources, stop the destruction of genetic biodiversity (especially that found in tropical rainforests), and to reverse the wasteful extraction of natural resources, in addition to controlling various forms of environmental pollution. Most of the practical sustainable development projects around the world have been undertaken in rural and agricultural development settings (Simon, p. 42). In other words, there was and is an important need to explore how the ideas and approach of sustainable development relate (conceptually and in practice) to urban phenomena. Apart from earlier efforts such as Peter's, which were not identified as sustainable development, probably the most significant next step in developing this relationship was the World Commission on Economic Development, whose work and report did include references to urban settlement.

THE BRUNDTLAND COMMISSION AND URBAN CONDITIONS

The World Commission on Economic Development (the Brundtland) Report, *Our Common Future*, devoted one of its chapters to "The Urban Challenge" (1987, chap. 9). That chapter contained a very brief section on urban settlement and problems in industrialized countries. It characterized the urban conditions in those countries as having improved steadily in this century. It also argued that most urban dwellers in those countries were relatively well provided with local public services (WCED, 1987, p. 242). The Report concluded that the governments in the advanced industrial countries have ". . . a capacity to manage, control, experiment, and lead urban development . . . toward more environmentally sustainable urban development patterns and conditions" (WCED, 1987, p. 243). In contrast, the Report concluded that the developing countries, with their growing numbers of mega-cities, "have a major urban crisis on their hands." And it was on that crisis and "the urban challenges in developing countries" that the Brundtland Commission Report focused most of its attention. While helpful from the sustainable development viewpoint of "Think globally, act locally," addressing these serious urban problems of developing countries is not within the scope of this particular paper. Therefore, the major observation

about the Report from the perspective of this paper is that, though it made reference to urban phenomena in advanced industrialized countries, it did not provide the policy framework or conceptual tools necessary to relate sustainable development to practical urban policymaking properly. Beyond its claims, that urban conditions are not as bad in industrialized countries, and that the key is making appropriate public policy (and social) choices in those countries, the Report provides only more general principles and policy priorities. Fortunately, more policy direction can be found elsewhere, and it is to that which we now turn our attention. (For further discussion of the more general and specific aspects of sustainable development in relation to urban phenomena, consult the other papers in this volume).

THE NEW URBAN POLICY AGENDA

Evidence of more policy-related considerations can be found in an important article by James MacNeill, the Canadian who was the Commission's secretary general (MacNeill, 1989-90). In this article, MacNeill contrasts the previous environmental policy agenda with the Commission-proposed sustainable development policy agenda. The standard agenda of environmental protection dealt with three inter-related groups of issues: pollution, natural resources and urban issues. This last group includes issues relating to land use and tenure, shelter, water supply and sanitation, social-health-education, mega-cities, and "managing urban growth" (MacNeill, p. 14). Although MacNeill acknowledges that this agenda of issues was important, it had a number of serious limitations in that it focused policy attention ". . . on the downstream end of the development cycle . . ." For example, it forced policymakers to consider the results of urban pollution or waste disposal, and on how to try to deal with or repair the environmental damage which already had been done. It included such old 'r' activities as " . . . restoring, retrofitting, reclaiming, and rehabilitating urban areas" (p. 15). This standard agenda tended to isolate issues ". . . as environment issues alone or as conservation and resource management issues . . . ," rather than interlocking them into integrated sustainable urban development policymaking.

MacNeill contrasts this old policy agenda with an "alternative" sustainable development agenda. In this new policy agenda, "urbanization and urban development" are still listed as significant concerns, but they and all the issues which they include are considered in the context of integrated environmental and economic policy development. Consideration of environmental costs and impacts--both immediate and those probable in the future--is no longer to be viewed as simply another "added-on" policy field, but rather it is to become an integrated component in public decision-making, like economic cost-benefit analysis. Henceforth, "All government agencies . . . must be held accountable for ensuring that their policies and budgets encourage development that is sustainable . . .", no matter what the objects or substance of those policies (MacNeill, 1989, p. 18).

MacNeill does not elaborate on how this new policy framework will be applied to the urban phenomena and issues which he identifies as important components of both the old and new policy agendas, nor does he relate his treatment to the broader public policy literature which has developed in Canada.[5] Such an application remains to be undertaken, and is beyond the scope of this paper. However, MacNeill does provide some important general guidelines and principles which we can apply to the task of formulating a sustainable development approach to urban policymaking.

CANADIAN NATIONAL RESPONSES AND POLICY PERSPECTIVES

Having delineated the broader context of our subject, let us narrow our focus to consider the Canadian national responses to the Brundtland Commission and to this new policy perspective of MacNeill, who has continued his interest and involvement in developing Canadian sustainable development policy. A major step forward appeared to be taken with the Prime Minister's announcement to the United Nations in November 1988 that Canada would become a leading centre of sustainable development (including establishment of an international centre in Winnipeg). However, later analysis has indicated that this was more a political strategy than a serious policy commitment (Robson, 1990). The materials available to me suggest that the policy emphasis of the federal government remains focused on the older environmental agenda. Perhaps because the provinces have guarded their claims to urban policymaking and control over local government, there are few references to urban phenomena or to those urban policy components which we have noted in the Brundtland and MacNeill materials. In fact, the major report and foundation for subsequent sustainable development actions by Canadian Resource and Environment Ministers (The National Task Force on Environment and Economy, 1987) did not even mention urban phenomena (though it did include a prominent picture of downtown Toronto). Instead, the primary focus was on environmental policy actions by provincial and federal governments: for example, their adoption of conservation and waste management strategies by 1992. The Task Force also recommended that public officials, business executives, and environmentalists be brought together in quasi-governmental "Round Tables on Economy and Environment" to develop further sustainable development strategies at the federal and provincial levels. (Local or urban Round Tables were not mentioned). These new policy groups would recommend strategies and policies to foster and promote environmentally sound economic development, as well as strategies and policies to deal with environmental problems. These policy Round Tables have subsequently been set up in most provinces and at the national level.[6] However, they have few or no explicit responsibilities regarding urban conditions and policies, except as they fit into the Round Tables' broader mandate. Therefore, the author

found little in their work which contributed to more clearly relating sustainable development to urban policymaking.

The official response of the Canadian Environmental Advisory Council to the Brundtland report included a brief reference to "the sustainability of the urban environment and of the urban economy areas . . . ," suggesting that in many ways ". . . cities could become more self-sufficient . . . ," thereby benefiting and empowering themselves (CEAC, 1987, p. 56). More significant for this paper, the Council sponsored a study relating sustainable development to land use planning in Canada (Richardson, 1989). This study is very important to the subject of this paper, because it applies sustainable development concerns about the biosphere, environmental protection, and general urban problems to the particulars of land-use planning, policies, and regulatory actions by provinces and local governments. (It also discusses land-use planning and regulation by the federal government on federally controlled lands and waters). Richardson's main thesis is that land use policies can and should be the primary tool or vehicle for achieving sustainable urban development goals (Richardson, 1989, p. 47). In the course of developing this thesis, Richardson provides an important definition of sustainable urban development as: ". . . a process of change in the built environment which fosters economic development while conserving resources and promoting the health of the individual, the community and the ecosystem (recognizing that . . . the urban environment cannot be separated from the region of which it is a part)" (Richardson, 1989, p. 14).[7] This provides a key policy definition, because it links sustainable development with urban policymaking, and urban policymaking in Canada. This definition applies not just to land development but to various forms of urban economic development as well. It suggests the need for proactive, rather than reactive, consideration of sustainable development actions by public decision-makers, private land developers, and the general public. Richardson also reviews the evolution of land-use planning policies in Canada, various conservation strategies, environmental impact assessment systems, and other land-use policies which are already in place across Canada. In summary, this report appears to provide an important foundation for further development and formulation of sustainable urban development policies as they relate to urban policymaking and land-use planning. Richardson concludes with an interesting challenge: "If land use planning is to be used to achieve sustainable development, sustainable development must be clearly established as the goal of land use planning by the governments of Canada" (Richardson, 1989, p. 40).

In other relevant Canadian literature, the B.C. Island Trust has been described in terms of sustainable local policymaking (McGonigle, 1989). As well, an internal study undertaken for the Province of Ontario has applied the terminology of sustainable development to urban land development policies (see end note 4). There are also several other specific applications of sustainable development ideas in

practical urban planning and policymaking which are noted in the other papers in this volume and in the end notes to this paper. However, clearly much remains to be done in the work of applying sustainable development ideas to urban policymaking in Canada. With this in mind, it is our particular task to examine how sustainable development is being related to urban policymaking in Winnipeg.

SUSTAINABLE DEVELOPMENT AND URBAN POLICYMAKING IN WINNIPEG

PROVINCIAL INITIATIVES

A key event for the future of sustainable development was the election in early 1988 of a minority Progressive Conservative government led by Gary Filmon. Not only was sustainable development made one of the government's top priorities, Filmon made it his own personal priority. Among numerous initiatives, some of the more important were the appointment of Manitoba's first Environment Minister, creation of a Sustainable Development Coordination Unit within the Executive Council of Cabinet, and the development of the operations of the Manitoba Round Table on Environment and Economy, which the premier himself chaired. Of particular interest to this paper is the Round Table's adoption of basic sustainable development principles and guidelines (see Appendix 1), as well as the production of a core document entitled "Towards a Sustainable Development Strategy for Manitobans."[8] This document will include a section entitled "Capital Region Strategies." It will indicate suggested provincial objectives and guidelines for the further formulation of sustainable development policies relating specifically to the Winnipeg area.[9]

The Manitoba Round Table and the provincial government have also made progress in developing sustainable development strategies in several specific areas which are relevant to this paper: a series of land and water conservation strategies (with appropriate subordinate policies), a draft forest strategy (which includes the preservation and expansion of urban forests), a draft recycling strategy, and a Waste Reduction and Prevention Act.[10] Sources also indicated that in the forthcoming review of Plan Winnipeg, the City's comprehensive development plan, the City will be required by the Province to revise the Plan so as to incorporate sustainable development objectives and policies.[11]

The final project of the provincial government to be discussed here was securing the location in Winnipeg, as well as the funding, of Canada's International Institute for Sustainable Development. As noted above, originally its creation was announced by the Prime Minister in his 1988 speech on the environment to the United Nations General Assembly. However, its official organization and initial actual funding were not announced until March 1990, a year and a half later.[12] The actual federal funding was a disappointment to local officials and some business leaders, and City Council passed a resolution expressing its disappointment.[13] Much of the definition of the Institute's mandate and agenda must be

determined. The terms of incorporation indicated the Institute would serve as a nexus for the exchange of sustainable development information, research, education, professional skills and project financing. The Chairperson of the Institute's Board, a prominent local businessman, has indicated a major thrust will be helping developing countries find the financing necessary to implement environmental policies (Robson, 1990). At this writing the Institute appears to be perceived as having only marginal relevance to either provincial or local urban policymaking in Winnipeg. Perhaps the best comment was that credited to Terry Duguid, a Winnipeg City Councillor with an environmental consulting background: "Winnipeg is supposedly the nerve centre for sustainable development. . . . I'm saying we have to clean up our own act . . ." (Taylor, 1989).

CITY OF WINNIPEG INTERVIEWS

Personal interviews were conducted with key individuals in important City positions as a primary research foundation for what is presented in this section. However, the results should be understood to be indicative but not totally comprehensive and exhaustive. For example, the research indicated that there was little appreciation of the possible relevance of sustainable development among the City administrative officials who were interviewed. But this does not mean that none of the City officials have any appreciation or knowledge of sustainable development concepts and what they might mean for the City. Therefore, the purpose of this section is not so much to criticize what is not, as to indicate where this matter appears to be right now, and what could be--or should be--happening in the future. In other words, this section carries on at the local level the search for the nature and relevance of sustainable development to urban policymaking that was begun in the previous section. Given the nascent state of developing and applying sustainable development ideas to urban policymaking, it would be very surprising to find widespread appreciation and higher levels of development at the local level in Winnipeg, despite the provincial government's initiatives. What did the research reveal?

SUSTAINABLE DEVELOPMENT AND THE CITY ADMINISTRATION

The personal interviews with administration officials conducted for this study did not indicate awareness of sustainable development beyond general knowledge and some apprehension that sustainable development projects (recycling, for example) and policies (such as environmental impact assessment) would add more expenses to an already tight City budget. In other words, a prime concern is cost and cost-effectiveness of initiatives which have been identified as sustainable development projects, such as recycling demonstration projects or elimination of combined sewers. It does not appear that the implications and potential of the provincial sustainable development program have been

understood in terms of its relevance to City policymaking and administration. The interviews did not indicate that top City officials have been consulted or included in the provincial initiatives. (No evidence was found of this in conversations with provincial officials either.) Clearly, if sustainable development is to become important in urban policymaking in Winnipeg, City administration officials and senior staff must be more fully briefed as to the nature of sustainable development and its relevance to urban administration and management. This would appear to be particularly important in the context of the provincial government's current orientation, but it is also important in terms of the potential and possibilities inherent in the favourable acceptance of sustainable development perspectives in other Canadian cities. Winnipeg may either move ahead, or quickly lose the historic opportunity to develop sustainable practices of city management. One obvious step in this direction would be the development of sustainable development review capacities in the Research and Policy Analysis Branch, which serves the Chief Commissioner and the Board of Commissioners.

As far as the interviews indicated, the City of Winnipeg does not have any administrative unit--office, branch, division, or department--which has been assigned the specific task of monitoring environmental impacts of City operations, or promoting environmental and sustainable development policies (as the environment ministers and administrative units do at the federal and provincial levels). The so-called "Environmental Planning Department" describes its primary concern as assuring ". . . a high standard of quality in land development, building construction, and community services within the City of Winnipeg," by ". . . monitor(ing) every proposed project that falls within this realm" ("The Planning Function," 1988, pp. 6-7). In other words, the Department's policy mandate appears to be focused much more on assuring that land development projects meet standards of quality and planning than assuring that natural environments and ecosystems are sustained for future generations. However, there are some potential elements of sustainable development in the operations of the Department's Community Programs Branch and in Winnipeg's comprehensive development plan, Plan Winnipeg.

THE POTENTIAL OF PLAN WINNIPEG

Plan Winnipeg was completed in 1981, and finally given final reading as a formal by-law in 1986. It does not mention sustainable development, but it does include implicit building blocks for formulating sustainable urban development strategy for the City--and the surrounding region.[14] For example, the central focus or theme of "Containment/Revitalization" can be much better understood and rationalized within a context of promoting sustainable development than within a negative perspective of trying to correct inner city decline and decay by "containing" suburban development (which is already sprawling out into the countryside, well beyond City boundaries in several directions).[15] Other implicit sustainable

development policies in Plan Winnipeg include its environmental conservation and improved waste management policies, riverbank stabilization and greening, the further development of urban parks and green spaces, and its emphasis on revitalizing and conserving the inner city. It also supports sustainable urban development with its emphasis on encouraging the development of vacant land in areas which are already serviced, along with the limitation of new urban development in unserviced areas. This limitation on urban sprawl within the City boundaries was symbolized, as well as made very specific, by the Plan's "Urban Limit Line." That geographic Line indicated the boundary beyond which the City would not approve land development which forced it to extend its major services; in the explicit policy statement of Plan Winnipeg, trunk sewer and water lines only, but in practice, other major infrastructure and services as well.[16] Land developers have spoken against this line, and senior planners have declared that other policies make it unnecessary; however, the policies and orientation which it represents are important components of a sustainable urban land development strategy for Winnipeg. Such a strategy may provide the framework in which developers, planners, environmentalists, and the general public can better understand the need for the plan's policies and the Line. Although interviews did not indicate widespread appreciation of it, there appears to be great relevance of sustainable development to the existing Plan Winnipeg, and great opportunity explicitly to recognize its importance in the forthcoming process of revising Plan Winnipeg (scheduled to be completed by April 1991). Winnipeg and the Provincial Department of Urban Affairs planners should work together to integrate sustainable development strategies into that process and the revised Plan. The City of Ottawa is reported to have already undertaken such a revision.

THE WASTE MINIMIZATION STRATEGY

Another important part of the City administration in terms of sustainable development is the City's Waterworks, Waste and Disposal Department. It deals with environmental pollution control issues in the course of operating the City's water and waste disposal systems. The City has also undertaken major sewer construction, studies and inaugurated policies designed effectively to deal with the problems of combined sewer overflows in some parts of the City (which are the main source of periodic river pollution) (Lorenc, 1989). In addition, this Department and other relevant units of the City administration and Council are now considering the report of an outside consultant recommending a long-term waste minimization strategy for the City. Most relevant to this paper is the fact that this study's research and its recommendations are based upon ". . . the philosophy of sustainability and cost-effectiveness."[17] Although we will not discuss this report in detail here, a summary of its more relevant recommendations is included with this paper as Appendix 2. It is arguable that those recommendations create a sustainable

waste management policy which could be a major cornerstone of a broader sustainable Winnipeg strategy. At the same time, this waste minimization strategy provides a policy framework for such activities as recycling, improvements in landfilling, and numerous other subcategories of sustainable development projects. However, the interviews with officials did not indicate widespread appreciation of the significance of the Waste Minimization Strategy Report, and it remains to be determined which parts of it are implemented. Rather, the focus among administration officials appeared to be on the immediate cost aspects of activities like the existing waste recycling projects, and the problems of finding or developing local processors and markets for recycled materials. This concern for costs was also expressed when sustainable development policies were mentioned. Therefore, at the present time City administrators want to know "what is the additional cost?" when sustainable development projects, policies, and strategies are discussed in relation to City operations. As well, administrators will be aware of the problems encountered in Ontario with overly ambitious recycling and "blue box" projects (McInnes, 1990; Olijnyk, 1989). On the other hand, this is clearly an important emerging field of program and project innovation in which Winnipeg will or will not take leadership in developing sustainable urban development policies and practices.[18]

SUSTAINABLE CITY FINANCING

Sustainable development ideas may also have great relevance to City budgeting and financial administration. It will be recalled that one of the central definitions of sustainable development provided by the Brundtland Report was meeting the needs of the present without denying future generations the opportunity to meet their needs. This intergenerational perspective of sustainable development thinking has important implications for considerations of how much money the City should borrow: i.e., not so much that at current and future rates of interest, future generations of local taxpayers will be unable to fund needed capital works because City officials of today (and the past) already overburdened the current budget with principal and interest payments for the funding of past and current projects. The current Chief Commissioner has been urging that the City pay more of its capital budget "up front" and try to reduce its yearly debt-servicing costs. However, in this policy area as well as others, this is viewed in terms of cost-effectiveness rather than in terms of a broader sustainable City strategy. Applying such a strategic perspective might make more meaningful the policy changes that are being requested. Such a perspective would also help to moderate the concerns that sustainable development is simply a euphemism for additional costs related to environmental impact assessments and "green" projects.

OTHER POLICY AREAS AND ECONOMIC DEVELOPMENT

There are many other policy areas which repeat the pattern of discovered above: numerous City initiatives appear to fall within a broader sustainable City development strategy, but there seems to be little recognition by City administrators that they might do so, or that sustainable development might provide an important broader value framework within which the various initiatives would take on greater significance. For example, for the last four years the City has organized and carried out a yearly Operation Clean-Up campaign in which over 50,000 volunteers collect 300,000 pounds of litter from around the City (Newman, 1990). Local economic development planning and policymaking constitute another important area of urban policy, especially in terms of sustainable development.[19] In Winnipeg, as in most Canadian cities, local economic development promotion and policymaking include long-established traditions of direct involvement by prominent local business executives and local Boards of Trade or Chambers of Commerce (in Winnipeg, the latter is the case).[20] In Winnipeg, as in a growing number of larger Prairie cities, the responsibility for economic development promotion has been removed from the City administration and committee system, and delegated to the board and employees of a quasi-independent economic development corporation, the Winnipeg Business Development Corporation, which is joint initiative of the City and the Winnipeg Chamber of Commerce.[21] However, in Winnipeg this Corporation has not had a mandate to undertake comprehensive economic development planning and policymaking. To some extent, Plan Winnipeg (and its antecedent comprehensive plans) articulated such policy. But to a great degree, strategic analysis and policy development in this area have been minimal until recently. As this paper was in preparation, however, a Task Force on Economic Development presented its report and strategy for Winnipeg after almost a year of work.[22] The report incorporated the data produced by a specially commissioned consultant's study. Unfortunately, that study did not explore the nature or possible relevance of sustainable development.[23] Rather, it painted a dismal picture of Winnipeg in decline and needing major infusions of leadership and City funding in order to keep from falling further behind other major Canadian cities. The Task Force Summary Report accepted the study's general framework and recommendations, adding only a few platitudes regarding the promotion of sustainable development in the context of its discussion of several "emerging opportunities" and the location of the Sustainable Development Institute in Winnipeg. "Sustainable development should be woven into the fabric of each of [this strategy's] targets and become a target itself . . . ", it noted. It also suggested that Winnipeg should target sustainable development opportunities as if they were an industry in-and-of themselves.[24] However, sustainable development was not mentioned in the rest of the Task Force Report, or in the expensive and elaborate audio-visual presentation of the Report and the Task Force's recommendations. Nor was sustainable development a major focus of subsequent considerations

of the Task Force Report, such as the day-long community leaders' conference on the future of Winnipeg, which featured the Task Force Report and discussions based on its analysis and findings.[25] It seems fair to conclude that for those involved in the development of this economic development strategy and policies for the City, sustainable development is at most only a minor distraction--or at most, a minor interest.[26] There clearly is a need to develop a much greater appreciation of the nature and relevance of sustainable development ideas, strategies and policies to Winnipeg's economic development policymaking. Such initiatives might come from the provincial Sustainable Development Coordination Unit, the Chamber of Commerce or the Institute of Urban Studies. They should involve the Mayor and members of the Winnipeg 2000 Leaders Committee (which the Task Force recommended), as well as the Business Development Corporation board and staff, and the City Councillors.

POLITICAL LEADERSHIP AND SUSTAINABLE DEVELOPMENT: THE MAYOR AND COUNCILLORS

The interviews conducted for this paper did not suggest that sustainable development was a priority of the Mayor, who last year was made the titular leader of City Council (shifting his role of chairing Council to a Presiding Officer through an amendment to the City of Winnipeg Act). The many new and existing duties of the Mayor make longer-term considerations difficult. However, the Mayor should take leadership in investigating the relevance of sustainable development to civic administration, economic development and other aspects of urban policymaking in Winnipeg. How the Mayor responds in the future to sustainable development ideas and proposals is crucial.

Most City Councillors appear to be unclear as to the nature and relevance of sustainable development to City policymaking. However, there are some notable exceptions. Several independent Councillors have expressed a preference for sustainable development priorities in City Council decision-making, as well as several of the eight new Councillors who were endorsed by a new civic reform group, Winnipeg in the Nineties (WIN). This progressive civic election coalition included sustainable development in its draft policy platform in a manner that reflects the best appreciation and application of the concept in Winnipeg (Appendix 3).[27] A number of the WIN Councillors have indicated their personal interest in promoting sustainable development priorities and projects, although none has suggested that there is a plan to implement each one of the proposals in the draft platform.[28] Therefore, it remains to be seen whether these policy proposals by WIN members will be translated into urban policy priorities by the WIN-endorsed Councillors through their efforts on Council, on standing and ad hoc committees, and on boards such as the Development Corporation Board. One proposal by another Councillor is that Council create

". . . a subcommittee of Council, a watchdog committee, to look at environmental issues in the context of real sustainable economic development" ("Think globally, act locally," 1990).

SUMMARY OF LOCAL RESEARCH

The Province of Manitoba's sustainable development emphasis includes development of a strategy for the Winnipeg region, as well as numerous policies and projects which affect the City. However, there is a general lack of awareness among most City officials and community leaders of the nature and relevance of sustainable development to local urban policymaking in Winnipeg. At the same time, there are potential elements of sustainable development in Winnipeg urban policymaking, such as Plan Winnipeg and the Waste Minimization Strategy. Local leadership sensitive to the relevance and potential of sustainable urban development strategies is needed. Although it does not appear to have yet developed in the City administration or among those most involved in consideration of a new economic development strategy for Winnipeg, there are indications of awareness by a number of Councillors and groups such as WIN. What appears to be lacking is a forum in which public officials, community leaders, and environmentalists may come together to examine if and how sustainable development can be more effectively related to urban policymaking in Winnipeg--how sustainable development might enrich and improve the policy framework for the various types of policies discussed above (and others which it is not possible to explore in this paper).

CONCLUSION

In this endeavour, it seems to me that the Institute of Urban Studies has the opportunity to take the leadership, and that the further application of sustainable development to urban policymaking in Winnipeg depends upon the taking of that leadership. The provincial government has its particular priorities, as do business, environmentalists and the City. At a minimum, the specific application of sustainable development to Plan Winnipeg and economic development planning should be examined in studies and conferences, although a broad-ranging application to City policymaking would also be helpful.

The application of sustainable development ideas and practices to urban policymaking is in its infancy. Winnipeg is at the centre of both federal and provincial initiatives which create a positive, nurturing environment for local innovation and leadership. Within Canada and throughout North America, there are some exciting advances being made in various types of sustainable development and "green" city practices, such as recycling and waste minimization. There are also policy changes such as the revision of comprehensive plans to reflect sustainable development priorities. It will be interesting to see whether Winnipeg officials and citizens grasp the opportunities for leadership and innovation which are

available to them within the local context. But Winnipeg also has the opportunity to extend its perspectives beyond the local and continental contexts to "Think globally, and act locally." The future of the idea of sustainable development–and of our cities!–can be found in our willingness to relate the concept to practical urban policymaking in terms of concepts and practices. And therein lies at least part of the answer to the basic question with which we began: is sustainable development an idea whose time has come?

APPENDIX 1

MANITOBA'S PRINCIPLES AND GUIDELINES FOR SUSTAINABLE DEVELOPMENT

Principles of Sustainable Development

Here are the 10 Principles of Sustainable Development approved by the Manitoba Round Table on Environment and Economy at its Feb. 15 meeting:

1. Integration of Environmental and Economic Decisions

This principle requires that we ensure economic decisions adequately reflect environmental impacts, and environmental initiatives adequately take into account economic consequences.

2. Stewardship

This principle requires that we manage the environment and economy for the benefit of present and future generations.

Stewardship requires the recognition that we are the caretakers of the environment and the economy for the benefit of present and future generations of Manitobans. A balance must be struck between today's decisions and tomorrow's impacts.

3. Shared Responsibility

This principle requires that all Manitobans acknowledge responsibility for sustaining the environment and economy, with each being accountable for decisions and actions, in a spirit of partnership and open cooperation.

4. Prevention

This principle requires that we anticipate and prevent significant adverse environmental and economic impacts of policy, programs, and decisions. Where it is impossible to prevent all environmental or economic damage from occurring, mitigative measures must be taken.

5. Conservation

This principle requires that we maintain essential ecological processes, biological diversity and life-support systems of our environment; harvest renewable resources on a sustained yield basis; make wise and efficient use of our renewable and non-renewable resources.

6. Recycling

This principle requires that we endeavour to reduce, reuse, and recover the by-products of our society.

7. Enhancement

This principle requires that we enhance the long term productive capability, quality, and capacity of our natural ecosystems.

8. Rehabilitation and Reclamation

This principle requires that we endeavour to restore damaged or degraded environments to beneficial uses.

Rehabilitation and reclamation requires ameliorating damage caused in the past. Further policies, programs and developments should take into consideration the need for rehabilitation and reclamation.

9. Scientific and Technological Innovation

This principle requires that we research, develop, test, and implement technologies essential to further environmental quality and economic growth.

10. Global Responsibility

This principle requires that we think globally when we act locally.

Global responsibility requires that we recognize there are no boundaries to our environment, and that there is ecological interdependence among provinces and nations. There is a need to work cooperatively within Canada, and internationally to accelerate the merger of environment and economics in decisions and to develop comprehensive and equitable solutions to problems.

FUNDAMENTAL GUIDELINES

In addition to these principles, there are a number of fundamental guidelines. These guidelines have equal status to the principles, supporting them and indicating how the vision for Manitoba will be achieved.

1. Efficient Use of Resources

We shall encourage and support development and application of proper resource pricing and establishment of appropriate demand management, resource allocation and tenure systems.

This requires incentives and disincentives to encourage efficient use of resources and full environmental costing of decisions and developments.

2. Public Participation

We shall establish appropriate forums which encourage and provide opportunity for consultation and meaningful participation in decision-making processes by all Manitobans. We shall endeavour to ensure due process, prior notification and appropriate and timely redress for those affected by policies, programs, decisions, and developments.

3. Understanding and Respect

We shall be aware that we share a common physical, social and economic environment in Manitoba. Understanding and respect for differing social and economic views, values, traditions, and aspirations is necessary for equitable management of these common resources. Consideration must be given to the aspirations, needs, and views of various regions and groups in Manitoba.

4. Adequate Access to Information

We shall improve and refine our environmental and economic information base and promote the opportunity for equal and timely access to information by all Manitobans.

5. Integrated Decision-making and Planning

We shall encourage and support decision-making and planning processes that are open, cross-sectoral, incorporate time horizons relevant to long-term implications, and are efficient and timely.

6. Substitution

We shall encourage and promote the development and use of substitutes for non-renewable resources where they are both environmentally sound and economically viable.

Source: Sustainable Development Coordination Unit, 1990, p. 2.

APPENDIX 2

EXCERPTS FROM THE CITY OF WINNIPEG WASTE MINIMIZATION STUDY EXECUTIVE SUMMARY

. . . This study was conducted for the City of Winnipeg Waterworks, Waste and Disposal Department and was designed to develop a long-term waste minimization strategy for the City. Specifically, the direction of the study was to focus primarily on the philosophy of sustainability and cost-effectiveness . . . (p. 2).

. . . On the basis of this study, it is recommended that the City of Winnipeg:

- Amend Plan Winnipeg to include, as a primary objective, the promotion of cost-effective, sustainable waste minimization policies and programs. In addition, the City should adopt the following as their hierarchy for managing solid waste, accepting that landfilling is a necessary component of any strategy . . .

  #1 Reduce: Use non-disposable, durable products; use products containing a component of post-consumer materials; and switch to lighter materials wherever possible . . .

  #2 Reuse: Largely in terms of reusable containers, but also in terms of disposable semi-durables . . .

  #3 Recycle: Reclaim potential waste material before it is discarded and use it to make the same or another product.

  #4 Recover: means to recover energy in the form of heat from waste materials or resources such as composted materials.

- Develop a procurement policy that is clearly preferential toward materials that encourage reuse/recycling or facilitates the 4 Rs . . . of waste management after use.

- Development of an internal program for all Civic offices of in-house waste stream segregation and marketing with particular emphasis on fine paper, computer paper, metals and glass.

- Undertake to provide (on a subsidized basis) backyard composting units . . . as a pilot project. These potentially can be built locally from recycled materials and be made available by mid-summer of 1990.

- Designate and support one or more trial recycling depots . . .

- Designate and support curbside collection programs (blue bag or blue box) to investigate the effectiveness and viability of . . . larger-scale forms of [existing] separation and recycling activities (e.g., [the] Wolseley and Wildwood Park pilot programs).

- On the basis of the relative performance of the depot and curbside trial programs, in terms of sustainability and cost-effectiveness, select and institute a process to serve the entire city.

- Raise tipping (landfill) fees to provide a fund to support solid waste minimization and recycling activities . . . (pp. 3-5).

APPENDIX 3

EXCERPTS FROM WINNIPEG INTO THE NINETIES (WIN) POLICY THEMES, AS UPDATED AT THE SEPTEMBER 16, 1989 POLICY CONFERENCE"

The Winnipeg Into the 'Nineties (WIN) movement is a volunteer group of citizens dedicated to a vision of how the City of Winnipeg should and can be developed . . . Candidates who run under the banner of the movement will be committed to supporting policies worked out by the membership that address the following themes: . . .

3. **SUSTAINABLE ECONOMIC DEVELOPMENT AND ENVIRONMENTAL RESPONSIBILITY**
WIN will promote an integrated strategy of economic development that is in harmony with the environment and respects the City's overall development plan--Plan Winnipeg. WIN will work with a cross section of business, labour, and community interests to generate new opportunities for economic growth and job creation in fields such as tourism, new appropriate technologies, health care, and community economic development. Simultaneously WIN will (develop) policies for reviewing the environmental impact of new developments, protecting public access to river banks, preserving and restoring heritage buildings, as well as for the recycling and conservation of our limited environmental resources such as farm land and water.

To complement WIN's economic strategy there will be a transportation policy which emphasizes efficient public transit to serve Winnipeg's changing demographic reality . . . Winnipeg's public transportation system should consider re-electrification and other new technologies to eliminate fuels which cause pollution.

[Proposals and motions from the floor]:

(a) That WIN ensure that nothing is done at City Hall to the detriment of future generations . . .

(b) That WIN encourage the City to sponsor research oriented conferences on effective, sustainable, economic development and actions . . .

(d) That WIN sees a need for a set of basic environmental criteria against which to measure development . . .

(g) That the City Planning Committee needs to have more authority, and that all members, including the City planners, must be knowledgeable of environmental issues . . .

"Mimeographed report, pp. 1, 3, 4.

NOTES

1. This paper is a revised version of an oral and visual seminar presentation given on April 25, 1990 as the last seminar in the series "Sustainable Development and Urbanization: Ethical Dimensions" organized by Dr. Mary Ann Beavis and the Institute of Urban Studies.

2. In the footnote, Peter also reveals that it was while working in the Vancouver school system that he first made the observations which he began to develop into the principle which make him famous. He obviously was also influenced by the patterns of urban development which he observed there. But he notes that his characterization of "Excelsior City" was strongly influenced by his subsequent experience of living in various American cities (Peter, 1977, p. 3).

3. Among those who have referred to sustainable development as "an idea whose time has come" is the Premier of the Province of Manitoba (Filmon, 1989, p. 421). There are many other prominent individuals endorsing such a view (e.g., *Scientific American*, Special Issue, September, 1989, "Managing Planet Earth").

4. For example, news reports indicated that in 1989 a confidential report to the Ontario Government ("Reforming our Land Use and Development System") recommended replacing the various laws affecting land uses with a single law to be called The Sustainable Development Act. According to the reports, this Act was actually designed to streamline the approval processes for allowing land development. In doing this, municipalities would be given greater authority and the responsibilities for environmental assessment would have been taken from Ontario's Environment Ministry and reallocated to Municipal Affairs. Both the opposition parties (New Democratic and Progressive Conservative) objected to this as a step backward in terms of environmental protection (McInnes, 1989).

5. We shall not deal here either with public policy in general, or with urban policymaking in particular. In the Canadian context on the former, consult Leslie A. Pal (1987). On the latter subject, consult Loreto and Price, 1990.

6. At the time of writing, ten Canadian jurisdictions had Round Tables (Sustainable Development Coordination Unit, 1989, p.8). The only local Round Table known to the author is the Peterborough Committee on Sustainable Development (Sutherland, 1989).

7. I would place "bio" just before, and connect it to the word "region" in this definition, clearly to reflect important current environmentalist perspectives.

8. This and other relevant materials can be ordered from the Sustainable Development Coordination Unit, 305-155 Carleton Street, Winnipeg, Manitoba R3C 3H8.

9. Unfortunately, further information was not available for this study, except that it will probably include about ten proposed objectives and guidelines. These are supposed to be discussed further, and ultimately developed into provincial and municipal policies.

10. Some of this information is contained in the cited *Agenda for Sustainable Development in Manitoba* (newsletter of the Sustainable Development Coordination Unit). The other sources are other publications of the Sustainable Development Coordination Unit and a November 7, 1989 Fact Sheet on the W.R.A.P. Act from the Manitoba Environment Department.

11. In doing so, Winnipeg will not be the first Canadian municipality revising its development plan to incorporate sustainable development goals, strategies and policies. Ottawa has apparently already done so, but the process and result were not available in Winnipeg at the time of writing.

12. I will not here discuss the politics surrounding the original announcement or the reasons for the delay in actual creation and reductions in funding. For suggestions and other details, consult Billinkoff, 1990 and Robson, 1990.

13. "Centre funding lashed," *Winnipeg Free Press*, 5 April 1990, p. 9. The Institute was originally announced as a "Centre," and its funding was reported to be about $100 million over five years, with substantial federal involvement. By the time it was finally announced, it had become an "Institute," and its guaranteed funding had been reduced to $5 million for the first year. Of that amount, only $3 million was to come from the Federal government. In addition, the Filmon government had to allocate $500,000 to underwrite its initial start-up expenses in order to make it fully operational (Billinkoff, 1990; Robson, 1990). A major concern for the Institute is whether and how it will become financially sustainable. Its March 1990 information indicates that ". . . funding of specific programs and initiatives will be supplemented by other sources, including support from the private sector, foundations, research and educational grants, and fees-for-service" (page 3 of informational handout).

14. For background on and an overview of Plan Winnipeg, consult *Information Winnipeg Quarterly News*, 3,1 (Spring 1990): 5-10 (Department of Environmental Planning, City of Winnipeg).

15. This involves important issues of urban fringe development in the greater Winnipeg area, as well as the now defunct "Additional Zone," in which the City--like the Metropolitan Corporation before it--originally exercised land use planning and control. The Institute of Urban Studies should be contacted for further information and available publications on this issue.

16. The exact boundary of this line was what the City and Province disagreed about from when Plan Winnipeg was presented in 1981 until it was given final approval in 1986 (though the final line was not settled until 1987). It has mostly remained intact, despite attempts to modify or contravene it, stopped both at the City level and by the Minister of Urban Affairs. On April 18, 1990 the Institute of Urban Studies sponsored a workshop on the Urban Limit Line in which the author participated, and from which the observations in the text are drawn. The Institute should be contacted regarding relevant publications.

17. *The City of Winnipeg Waste Minimization Study Executive Summary*, prepared for the City of Winnipeg Waterworks, Waste and Disposal Department by M.M. Dillon, Ltd. Consulting Engineers and Planners, January, 1990; quotation on p. 2.

18. Recycling and waste minimization programmes are currently being developed and implemented in many Canadian and American cities. To review them is beyond the scope of this paper.

19. Some conferences and publications are entitled "Sustainable Economic Development" or "An Economic Conference on Sustainable Development in Winter Cities" (Winter Cities Forum 1991, Sault Ste. Marie).

20. The more general subject of urban economic development policy is addressed by Meric S. Gertler, "Economic Development," in Loreto and Price, 1990, pp. 35-57.

21. The Corporation was the result of the economic development strategy recommended to City Council in 1978. It is directed by a Board which includes representatives of the business community, chamber of commerce, and labour councils, as well as the Mayor's Executive Assistant and a City Councillor. The Mayor is one member of a three-person board which is assigned the responsibility for reviewing the Corporation's operations, and he reports to Council which provides a yearly subsidy (last year $553,925).

22. This Task Force was headed by City Councillor Eric Stefanson, the City's Deputy Mayor. The membership also included two other Councillors, the Chief Commissioner of the City, and representatives of local businesses and unions. The Major was not on the Task Force.

23. This study was entitled *City of Winnipeg Economic Development Strategy* (Winnipeg: Price Waterhouse, January 1990). In its 100-plus pages of text, tables and recommendations based upon computer modelling and other sophisticated techniques, I cannot find any mention of sustainable development concepts or concerns. There is almost no discussion of the Sustainable Development Institute, recycling, or other sustainable development projects in Winnipeg, or of the provincial policy focus discussed in the preceding section.

24. *Winnipeg 2000: An Economic Development Strategy for Winnipeg, A Summary Report by the Winnipeg Task Force on Economic Development* (City of Winnipeg, January, 1990), p. 14.

25. The author attended the release of the Report and was a participant-observer at the Chamber of Commerce symposium which was held about two weeks later. The predominant emphasis was "how can we arrest Winnipeg's decline and stimulate more economic development, and a better self-image." The mimeographed report of the proceedings only mentions sustainable development in the context of groups of industries identified as "centres of excellence;" sustainable development was listed as one of four present centres. Among other things which should be done with regard to these centres, the report says: "Keep all centres of excellence environmentally sustainable" (Winnipeg Chamber of Commerce, 1990).

26. Separate from this initiative there has been Chamber of Commerce interest in sustainable development expressed through a subcommittee of the Civic Affairs Committee of the Chamber up to Spring 1990. At the time of writing, that subcommittee was being

reconstituted as an Environment/Sustainable Development Committee according to Chamber sources.

27. The policy proposals were adopted at an open policy conference in September 1989. Eight of the sixteen candidates which WIN subsequently endorsed were elected in the next month's civic election and now serve on City Council.

28. The most prominent of the WIN Councillors is Christine McKee, who was selected by the Mayor to chair the Committee on Planning and Community Services (and who therefore also sits on the Executive Policy Committee). She has expressed particular interest in promoting recycling and sustainable development projects, such as the elimination of snow-dumping from riverbanks (achieved early in 1990) ("McKee . . .," April 1990). WIN Councillor Glen Murray has championed global sustainable development issues in Council, and the idea of facilitating the development of the City's first environmentally friendly "green zone" in and around the Osborne Village shopping district.

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HARD COPIES, HARD CHOICES: PAPER POLLUTION IN THE INFORMATION SOCIETY

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Since the industrial revolution, successive waves of technological innovation have been hailed as more progressive and environmentally more benign than previous technological innovations. Indeed, as Leo Marx observed in an influential work, much nineteenth century innovation was idealized as representing a veritable "machine in the garden" (Marx, 1964). The latest incarnation of this myth is the concept of the "information society," whose technological base has been claimed to be cleaner, less polluting and more sustainable than older industrial technologies dependent on finite resources. In the words of Yoneji Masuda, Director of Japan's Information Society Project, an information society will "develop around the production of information values and will therefore differ fundamentally from the agricultural and industrial societies of the past which developed around the production of material values" (Masuda, 1981, p. 87).

Compared with other resources such as minerals or fossil fuels, information is seen as far less taxing on the environment as well as non-depletable (Oettinger, 1980). While traditional industrial production and consumption in the advanced nations may face environmental limits to growth, the expansion of information activities is viewed as essentially limitless. This is an important point when we consider the recent conclusions of the World Commission on Environment and Development (WCED) with respect to "sustainable development." In the Commission's view, continued economic growth in the advanced nations would be compatible with the environment and hence "sustainable," if the mix of economic activities could be shifted from those industries which are heavily resource-intensive to those which are much less so: "(Economic) growth rates could be environmentally sustainable if industrialized nations can continue the recent shifts in the content of their growth towards less material and energy intensive industries and the improvement of their efficiency in using materials and resources" (WCED, 1987, p. 51).

Similar views have been endorsed by other bodies. The Science Council of Canada has identified information technologies as "important building blocks of a sustainable economy" (Science Council of Canada, 1988 p. 15). Robert Paehlke (1989), in a major book on the environmental movement, suggests that, "Desirable technologies include computers, telecommunications and the whole array of information industries" (Paehlke, 1989, p. 108). The goal would be a non-physical, "angelized G.N.P." (Daly, 1977, p. 118) in which production and employment in service and information-producing industries would expand while declining in manufacturing and resource extraction. To a world hoping to maintain a simultaneous commitment to economic growth and a clean environment, non-polluting, non-depleting information industries appear to be an idea whose time has come (Mosco, 1989, p. 23).

Table 1

Proportion of the Labour Force in Information Occupations, Selected Countries, 1951-1982

	1951	1961	1971	1975	1981	1982
Canada	29.4	34.2	39.9			
W. Germany	18.3a	23.4	29.3d	32.8e	33.5	34.8
Japan	17.9b	22.2c	25.4d	29.6		
U.K.	26.7	32.1	35.6		41.0	
U.S.	30.7a	34.7b	41.1d		45.8f	
	a. 1950	b. 1960	c. 1965	d. 1970	e. 1976	f. 1980

Source: OECD, *Trends in the Information Economy*, 1986, p. 8.

Such overly optimistic views of the electronic/information society are of concern in this paper. While information in its pure or abstract form may be non-depletable, sustainable and environmentally benign, this is not the case so long as we rely on paper as the central medium of information storage, retrieval and dissemination. Nor do we accept the notion that the paper-intensive office, a heavy consumer of forest resources, is on the verge of replacement by the more efficient "office of the future," an agglomeration of electronic, magnetic and optical media. In fact, heavy utilization of computers, laser printing, xerography, facsimile and desktop publishing has led to rising consumption of paper and paper products. The "office of the present" is more paper-intensive than ever. Furthermore, the kinds of paper favoured by the information industries are highly bleached and coated and thus chemical-intensive in coating as well as difficult to recycle. Typically the paper ends up as waste and paper products make up about 40 percent of the composition of our solid wastes.

As information industries have expanded in North America, Western Europe and Japan, and are now growing rapidly in Latin America and the Pacific Rim, worldwide demand for wood fibre, the basic ingredient in paper-making, has continued to increase. Softwood forests in the temperate zones of North America and Western Europe, long the mainstay of the world pulp and paper industry, have been heavily depleted or subject to environmental restriction. Just as the oil industry has stepped up its search for "unconventional oil" in the North or undersea once conventional sources run out, so the paper industry has looked for new sources of untouched (virgin) fibre in the rain forests of the Southern Hemisphere and in the boreal forests of the Canadian North. This is why large-scale pulp and paper projects have been announced in all three Prairie Provinces, with a focus on the largely untouched mixed hardwood and softwood forests in the North. The Repap expansion and conversion slated for The Pas in Northern Manitoba, for instance, will gain logging rights over an area equivalent to about 20 percent of the land mass of the entire Province.

This paper will also examine the political economy of paper production and consumption with particular reference to the Repap situation in Manitoba.[1] Pulp and paper megaprojects will have an enormous impact on the social and natural environment of the Northern Prairie region. The slow-growing, fragile boreal forest will be at risk to extensive logging and the Northern rivers to large volumes of highly toxic sewered effluent. The sparse Native and non-Native populations will be inexorably drawn into the global market economy with the promise of well-paid jobs and the risk of dependency and insecurity. Traditional Northern activities such as fishing, trapping and tourism may also be subject to an uncertain future. Northern semi-processed bleached pulp will be exported to be converted into paper to feed the information industries of metropolitan North America and Japan. Thus, we face an ethical dilemma, under which high levels of paper consumption can continue in the public and private bureaucracies and com-

Table 2
Canadian Paper Production by Category, 1950-1988, 000 Tonnes

	News-print	Book & Writing	Sanitary	Tissue	Wrap-ping	Bldg.	Paper-board	Total
1950	4,825	194	59	11	202	83	796	6,180
1960	6,068	366	113	22	292	75	1,159	8,095
1970	7,996	821	199	19	438	101	1,678	11,252
1975	7,010	679	241	17	431	146	1,542	10,066
1980	8,625	1,059	377	–	533	–	2,344	13,388
1981	8,946	1,432	388	–	490	–	2,347	13,603
1982	8,109	1,475	375	–	454	–	1,982	12,395
1983	8,486	1,723	385	–	472	–	2,286	13,352
1984	9,013	1,943	399	–	430	–	2,440	14,225
1985	8,988	2,413	447	–	487	–	2,374	14,439
1986	9,288	2,400	459	–	541	–	2,573	15,261
1987	9,673	2,656	456	–	567	–	2,695	16,046
1988	9,969	–	–	–	–	–	–	16,640

Source: Forestry Canada, *Selected Forestry Statistics 1988* (1989), p. 52.

munications media, while some benefits and much risk are borne by the resource-supplying hinterland.

We will now discuss each of these issues in greater detail.

THE INFORMATION SOCIETY AND PAPER WASTE

One of the major concepts to emerge from the literature on social and technological change over the past decade has been that of the information society (Bell, 1979; Oettinger, 1980; Masuda, 1981). In an information society the production, transformation and exchange of information displaces the production and exchange of tangible goods–characteristic of an industrial society–as the primary focus of economic activity. Putting aside debates on whether an information society actually represents a new social formation or is simply derivative of the familiar capitalist industrial society, it is clear that information-related activities have increased in the advanced nations. Between 1960 and 1980 (in the U.S.), such activities grew at an average rate of 8.4 percent per annum (Hurwitz, 1987). The mass media, advertising, printing and publishing and data processing have expanded enormously in the post-war period. More recent innovations such as personal computers, xerography, digital communications networks, facsimile transmissions and desktop publishing promise to further transform the already radically altered information industries.

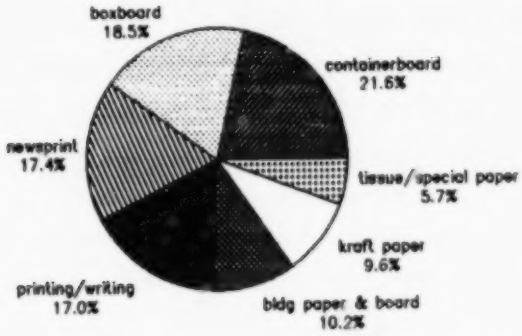
Porat (1977) in a path-breaking study for the United States Department of Commerce has documented the transition to an information economy. His work provided the empirical basis for subsequent theorizing by Bell, Oettinger and others. He argued that information-based occupations are now dominant in the American labour force, accounting for about 45 percent of all occupations, up from 30 percent in 1920. This would include information industries such as telecommunications, broadcasting, advertising, computers, education and financial services. At the same time, agricultural and industrial occupations have been declining, while service occupations have levelled out. Similar trends have been noted in Canada, Western Europe and Japan (see Table 1). The growth of an information economy in Japan is especially important, as this resource-poor nation shifts the basis of its economy away from heavy industry and towards the production and export of information, capital and other services.

Along with these trends, predictions were made that the "office of the future" would be virtually paperless, i.e., that electronics information management would soon eliminate heavy usage of paper. For example, Bell (1981) stated that an information explosion would continue throughout the 1980s, and, as a result, could *only* be handled through an automated system:

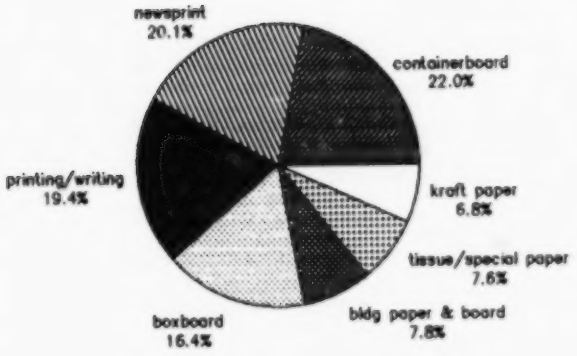
> The really major social change of the next two decades will come in the third major infrastructure, as the merging of technologies of telephone, computer, facsimile, cable television and video discs lead to a vast reorganization in the modes of communication

Table 3
Paper Consumption in Canada by Category, 1970-1988, Percent

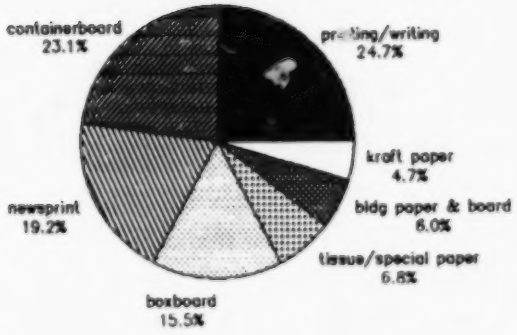
1970



1980



1988



Source: CPPA.

> between persons; the transmission of data; the reduction if not the elimination of paper in transactions and exchanges . . . (Bell, 1981, p. 533).

Similar predictions of the trend toward the "paperless office" were made by Giuliano (1982, p. 149) and Taylor (1981, p. 10) who foresaw the breakup of traditional paper-based bureaucracies–the theoretical legacy of Harold Innis and Max Weber–and their replacement by new forms of electronic networking. Yet, continuing trends in paper usage have failed to support this type of prediction.

Despite the advance of electronic communications, or perhaps because of it, paper remains the preferred communications medium. Information producers, transformers and consumers all demand a "hard copy" in one form or another, but always on paper. In fact, there seems to have been an upward trend in office paper use for several decades. According to Paul Strassmann, "Office paper usage, per information worker, has been growing steadily since 1946 at a rate about double that of the growth in the GNP" (Strassmann, 1985, p. 167). The spectacular growth of fax machines and laser printing in recent years confirms the preference for paper-based means of communication.

A cursory glance at data on Canadian production and consumption of paper will illustrate some of the above trends. While overall production of paper has increased in the 1980s, there has been a switch to the forms of paper associated with newer information technologies (see Table 2). Some of the strongest increase has come in the category of fine papers which include the bond paper used in office information processing and the coated paper used in glossy magazine publishing. Consumption data which control for the fact that Canadian production figures are distorted by heavy exports of newsprint reveal that printing and writing paper (used in a variety of printing methods from mass circulation magazines to computer printers) has risen to first place in per capita consumption, ahead of newsprint or paperboard for packaging (CPPA, 1989). As can be seen in Table 3, consumption of printing and writing paper increased 2.3 times between 1970-88, compared with an average increase of 1.4 times for all grades. Thus printing and writing paper consumption has increased at a rate of almost twice the average since 1970 (CPPA, 1989, p. 25).

Moreover, between 1979-89, paper consumption per head in Canada rose from approximately 212 kg to 220 kg (British Paper and Board Federation, 1990). By comparison internationally, it can be seen that we are heavy consumers; in terms of per capita consumption we are fourth among the top twenty consumers, at 469 lb/year (Pulp & Paper Factbook, 1988, p. 346). The trend toward increased consumption of paper for the office is worldwide, with most of the increase coming in consumption of paper for computers and copiers. Rennel (1984) estimates that between 1970-80, world copying volume by xerography increased 800 percent from 38 to 342 billion copies, while offset reproduction increased

only 50 percent from 302 to 454 billion copies (Rennel, 1984, p. 188). Bleecker (1987) estimates that American business now generates 360 *billion* pages of documentation every day.

There are a number of theories, none of them definitive, as to why the growth of the newer information technologies has so far been unable to displace paper as the preferred means of information dissemination, storage and retrieval. Braten (1984) offers a variant of William F. Ogburn's theory of "cultural lag" in accounting for the continued demand for paper. In his view, the paper medium served a need to "touch and feel" information as well as transport and store it. This need is a heritage of our long dependence on clay and later paper-based media. The fleeting image on the screen, characteristic of television or its derivative, the video display terminal, fails to satisfy our need for a permanently "frozen" display (Braten, 1984, p. 15). This means steady demand in the foreseeable future for printers and printout material among information recipients and end users.

According to the MIT Research Program on Communications, information supply in the United States, mainly through the electronic media, grew at 8.4 percent per year between 1960 and 1980, while consumption of information grew at an annual rate of only 3.4 percent (Hurwitz, 1987, p. 89). We suggest that paper media can help bridge that gap, supplying information in a form which is more comprehensible to the average user than ephemeral electronic images. Zuboff (1982) provides support for this view with her observation that information workers have had difficulty making the transition from paper files to more abstract "computer-mediated" information systems.

Similarly, Strassmann stresses the importance of "touching" information, with special reference to VDUs (Visual Display Units). First and foremost, the human nervous system prefers hand-eye co-ordination (as used when simultaneously holding and reading a printed page) over a screen in which case the hands are not utilized. He adds other factors that are within the office environment, in which electronic reading is inhibited by harsh artificial lighting and uncomfortable desk positioning (Strassmann, 1985, pp. 171-72). To most people, paper simply is more adaptable and conducive to easy reading than is electronic equipment within the office environment. This exists in addition to the fact that information on paper is easy to duplicate by photocopier, especially for a large group of people wanting copies. Such copies may be for people outside the organization, or even inside it, as people have varying levels of skill with electronic equipment; thus some always need hard copies.

Another theory is based on the industrialization of the office and the difficulty of measuring "productivity" in information industries. Bleecker (1987) argues that the chief product of a modern office should be information and ideas rather than anything tangible which can be measured quantitatively. However, office work has been subject to the same dominant managerial orientation developed in the manufacturing sector which stresses quantitative tangible output. Hence, the office becomes a giant

paper factory, for paper flow can be counted and measured as the product of the office assembly line (Bleecker, 1987, 34). So far, electronic technologies have merely speeded up this paper flow rather than contributing to new and creative ways of working with information.

The significance of the above arguments is that information is a social entity and is involved in social exchange when being transmitted among people. This fact demonstrates the reason why technocratic predictions of decreased paper use in the electronic/information age have failed. Such predictions did not account for the humans who manipulate and attempt to comprehend information. Likewise, technocratic solutions will not likely solve the problem of increased paper usage. Further, other problems arise in relation to heavy consumption of highly processed paper.

Growing demand for paper has been a boon to the Canadian pulp and paper industry which ranks first among Canadian industries in value-added and third in total shipments. The pulp and paper industry is also one of Canada's leading industrial polluters. It makes heavy demands on the environment in its utilization of the nation's forests--about 25 percent of the annual cut--in its energy intensity, 28 percent of final industrial energy demand (Battle, 1986), and, especially, in its voracious need for water. Victor and Burrell (1981) claim that in Ontario the pulp and paper industry is responsible for about 80 percent of soluble organic material and 60 percent of suspended solids discharged by all industry into lakes and rivers. Another estimate suggests that the pulp and paper industry produces about 50 percent of all industrial pollution in Canada (Sinclair, 1988). Although pulp mill effluent levels have decreased in recent years--from an average of 250 cubic metres/tonne in 1970 to 125 cubic metres/tonne in 1986 (Bonsor et al., 1989)--the scale of the industry and the toxicity of the chemicals involved continue to arouse controversy.

Paper consumption in the information society also taxes the environment through its accumulation as paper waste. Data from 1988 indicate that paper and paper products account for 35 percent of Manitoba's solid waste versus less than 5 percent for plastics (Manitoba Recycling Action Committee, 1990). This can be broken down into newsprint, 14 percent, and other paper products, 21 percent. Paper accumulation in scarce dump sites represents the detritus of the information society.

Further, information industry requirements have included demands for whiter, brighter and stronger papers to produce glossier magazines or more sharply defined laser printing. The market has shifted toward the stronger bleached and chemical pulps used for printing and writing paper, and away from the unbleached and mechanical pulps used for newsprint. These papers require more chemical processing and bleaching, and thus produce more toxic industrial effluent. While demand for paper may be fuelled by developments in information technology, the manufacture of paper remains very much a chemical industry based on the application of nineteenth century inorganic chemistry. This pattern of technological

interdependence is quite common among major industries (Rosenberg, 1982). In 1984, for example, chemicals represented 18 percent of the value of all materials and supplies used in pulp and paper manufacture, while pulpwood represented 30 percent and recycled paper only 6 percent (Statistics Canada, 1984).

The dominant bleached kraft method of chemical pulping which uses sodium sulphate and sodium hydroxide to "cook" the pulp and chlorine and caustic soda to "wash" and bleach it was first introduced in Canada in 1907, but only became dominant after World War II when the bleaching process could be made more reliable and less costly. The kraft method produces a stronger and more versatile pulp than alternative groundwood or sulphite methods, but one which is darker and thus requires more bleaching. In addition to producing whiter paper, modern chemical bleaching has an association with cleanliness and progress ever since its application in the nineteenth century textile industry and diffusion to such areas as water purification and the manufacture of detergents. In 1965, the bleached kraft method accounted for 14 percent of total wood pulp production, but by 1988 that figure had risen to 35 percent. The bleached product, however, makes heavy demands on the environment in the form of toxic organochlorines, notably dioxins and furans, which must be disposed of in the form of sewered effluent. The environmental risks associated with bleaching and resource harvesting are borne at the production rather than the consumption end. Paradoxically, the growing information industry--generally thought of as environmentally benign--is contributing to environmental pollution at the production end.

Therefore, it is pertinent to suggest reasons why such forms of paper are preferred over less polluting but equally efficient varieties. Perhaps one is related to our ideals of cleanliness and hygiene. Barry Commoner, with phosphate-based detergents in mind, has noted the paradox of environmental damage caused by technologies designed to enhance personal cleanliness and hygiene (Commoner, 1972). Modern bleached and coated paper is the colour of a nurse's uniform. As well, it provides a facsimile of technological progress when compared with the softer, beige, unbleached paper of yesteryear. Further, in an age of fierce competition between paper companies, those which can produce a greater variety of brighter, "prettier," more technologically "advanced" forms of paper will gain a greater edge in the marketplace. This fuels increasing levels of chemical processing.

THE POLITICAL ECONOMY OF PULP MILL DEVELOPMENT

There is a paradox at work. Information industries are quintessentially urban, associated with the vast bureaucracies of business, government, communications and education, as well as large consumer markets for advertising and other information products. Yet the streams of paper that drive the information economy come from forests further and further afield, as invisible to most urban dwellers as the food

chains that supply their supermarket shelves. It is not surprising, then, that citizens living in resource-supplying and resource-consuming regions may have differing opinions on the economic and environmental significance of the industry that ties the two regions together. Perspectives derived from the study of Canadian political economy may shed some light on these differences.

Political economists, strongly influenced by the pioneering work of Harold Innis, have looked on Canadian economic history as a series of episodes devoted to the production and export of particular natural resource products or "staples" into metropolitan global markets. In this theory, economic growth has largely occurred through the generation of a series of staple resource exports destined for richer and more populous metropolitan regions (Watkins, 1989). Fur, fish, lumber and wheat for European markets were leading staple exports during the nineteenth century. In this century, there has been a shift to energy, minerals and pulp and paper, mainly destined for export to the United States. Canadian involvement in the world economy has been strongly influenced by dependence on multinational resource corporations, both foreign and domestic, as investors, resource extractors and exporters. Compared with other affluent industrial nations, we have concentrated far more on the production and export of raw and semi-processed commodities rather than finished goods. A staples economy is not a *laissez-faire* economy. Federal and provincial governments have been heavily involved in promoting resource extraction through provision of direct subsidies, financing of an expensive transportation infrastructure, supplying low-cost energy, and through generous land concessions and low resource rents.

A staples economy, however, has presented Canadian society with a number of serious, long-term problems. Chief among them is dependence on the vagaries of supply and demand in the global economy, and limited control of our own economic destiny. This is particularly the case in resource exporting hinterlands such as the Prairie and Maritime Provinces (Clement, 1983). Pulp mill developments in the boreal forest, north of the 53rd parallel, promise to draw this region more closely into global dependency. There has also been an evident failure to expand resource processing into the manufacture of finished goods. We export hydro-electricity rather than products made with electric power, and logs, pulpwood and newsprint rather than fine paper products. In terms of political economy, there are "leakages" or losses in the forward and backward "linkages" or benefits associated with resource extraction. If resources are exported unprocessed, the forward linkages associated with downstream manufacturing are lost, and if vast tracts of land are flooded for hydro developments or ruined by clearcut logging, with few employment benefits, then backward linkages are also negligible.

In terms of Canadian political economy, the division between pulp and paper production and consumption mirrors the regional division between hinterland and metropolis (Marchak, 1983). Increased demand for paper in metropolitan centres has expanded the world market for wood pulp, especially

bleached kraft pulp. World wood pulp consumption increased by 12 percent between 1980 and 1987, with North America accounting for 46 percent of consumption, Western Europe 24 percent, and Japan 8 percent. (CPPA, 1989, p. 29). Hinterland regions in Canada and other parts of the world are subject to intensive resource harvesting and the concomitant risk of environmental damage while the staple resource is exported to metropolitan centres for further processing and final consumption. In virtually all the developments slated for the Western boreal forest, semi-processed pulp is to be exported for the benefit of paper-making and information industries in the U.S. and Japan. In fact, the Repap conversion in Manitoba will eliminate the present paper-making capacity and transform it into purely a pulp mill to supply an American plant which makes glossy, magazine-grade paper.

This is no accident. It is precisely in the higher value-added areas of paper-making that the Canadian industry is weakest. Canada has about 10 percent of the world's forest stock, and accounts for 15 percent of world pulp and 32 percent of newsprint production, but only 3 percent of paper and paperboard output (Sinclair, 1988). In the 1980s, as exports of newsprint have levelled off proportionally, exports of pulp have increased. The rise of Japan and other Pacific Rim nations as economic powers with growing information industries has led to increased demand for paper. Capital rich but resource poor Japan now competes with the United States as a market for Canadian fibre. The Japanese trade strategy has been to protect its paper-making industry by obtaining more of their pulp from the Canadian hinterland. Not only are the hinterland regions exposed to environmental risk, but the job creation potential is also limited by the lack of downstream further processing.

At the same time, the pulp and paper industry is one of Canada's leading industries, whose annual output throughout the 1980s has been about 3 percent of G.N.P. In addition, pulp and paper shipments represent 12 percent of the value of all manufacturing shipments, and between 9 and 12 percent of total exports (CPPA, 1989). It ranks first among all manufacturing industries in value-added, third in total shipments and directly employs about 275,000 workers. In many areas of the country, especially 175 single-industry communities located mainly in British Columbia, Ontario and Quebec, dependence on the pulp and paper industry is a way of life.

These issues can be examined more closely in a case study of the proposed Repap expansion in The Pas, Manitoba, as well as other pulp mill developments proposed or underway in the boreal regions of Alberta and Saskatchewan. The vast boreal forest--huge strands of slow-growing spruce, jackpine, tamarack and trembling aspen stretching across the Central and Northern tier of the three Prairie Provinces--represents the last great untapped forest resource in the nation. The size of this Western forest has been estimated at 2,770 million cubic metres, or 13 percent of Canada's supply of

merchantable timber. However, this area currently produces only 8 percent of Canada's total primary forest production and 7.6 percent of pulpwood output. The potential for economic expansion is apparent.

Until recently the harsh climate, distance from major markets and relatively low density of tree growth compared with more Southern forests inhibited resource exploitation. However, several factors have combined in recent years to change the situation. As demand for wood pulp has continued to expand, Northern trees with their cellulose fibres tightly packed together have been found to produce high quality bleached kraft paper for printing, publishing and office use. New pulping technology developed in the United States and Japan allows the production of high-quality papers from Northern aspens and poplars, formerly thought of as junk or waste. This requires bleached kraft technology to produce bleached kraft market pulp to be made into high value-added paper for the printing, publishing and information industries rather than the traditional newsprint staple. The bleached product, however, makes the heaviest demands on the environment, particularly in the form of organochlorines, notably dioxins and furans, which must be disposed of through toxic effluent into the relatively pristine Northern ecosystem.

The Repap project in Manitoba and its counterparts in Alberta have received extensive support from their respective provincial governments. The Northern economies in both Provinces have long been characterized by higher unemployment and lower incomes than the South, and a dependence on extractive industries such as nickel mining in Manitoba and petroleum in Alberta. Pulp mills have been welcomed as a form of economic diversification. In Manitoba, Repap Enterprises Inc. of Montreal purchased the provincially-owned Manfor pulp mill in The Pas in May 1989. Manfor was a money-losing operation that operated one of the few unbleached kraft mills in North America which mainly produced fibre for brown paper bags. The purchase price was $132 million, of which the Province received $10 million in cash, and the rest in a complex transaction involving non-voting preferred shares of Repap Enterprises.

In return, Repap has gained access to cutting rights over 104,000 square kilometres of forest in Northern Manitoba, which translates into about 20 percent of the Province's land mass and 40 percent of its forest resources. Its annual allowable cut will be 3.2 million cubic metres, or about 10 million trees, of what Repap chairman George Petty has described as the "largest single remaining under-utilized softwood resource in Canada." Most of the cut will be black spruce, but about 25 percent will be hardwood. Royalties to the provincial government will be about $2.48 for a stand of trees, which, converted into bleached kraft pulp, will yield almost $1,000. The Province will also assume most of the cost of a cleanup of groundwater contamination at the Manfor mill site.

In Alberta, a provincial government economic diversification strategy has put up 221,000 square kilometres of public forest lands, covering about one third of the Province, for lease, and thirteen major

forest product startups or expansions of existing facilities have been announced or are underway. All told, some $3.5 billion in private investment is expected to add 12,000 jobs to the Alberta economy, and turn Alberta into a forest products producer to rival British Columbia and Quebec.

The announced projects in Manitoba and Alberta are noteworthy in several respects. Bleached kraft technology is preponderant: five of the eight new or expanded pulp mills will be bleached kraft operations. Secondly, the bulk of the bleached pulp from boreal forests will be shipped abroad, mainly to the United States and Japan, to be refined into paper products for the information industry. Also of note is the presence of Japanese investment in Alberta, reflecting the strengthening Japanese international investment position and continuing high Japanese demand for paper. Two of the largest projects, the $500 million Daishowa mill and the $1.5 billion Alberta-Pacific (ALPAC), billed as the world's largest kraft mill, are Japanese subsidiaries (Nikiforuk and Struzik, 1989).

Provincial government assistance was vital to this new round of forest project development. In return for agreeing to build a giant bleached kraft mill at Prosperity on the Athabasca River with a 1991 startup, ALPAC was granted cutting rights over 73,430 square kilometres of forests in the eastern Athabasca region. Although ALPAC is a joint venture of two giant Japanese multinationals, Mitsubishi Corp. and Honshu Paper Co., it received $300 million in government loans and another $75 million in road and rail construction to assist logging. It also received very favourable royalties on stumpage estimated at $1.40 per stand, and subject to fluctuation with world market prices for pulp.

In both Manitoba and Alberta, cutting rights on Crown lands have been ceded to private companies through long term forest management agreements (FMAs), which enable pulp producers to achieve backward vertical integration through their control of the provinces' productive woodlands. In a short space of time, virtually all the productive forestlands in both Provinces have been allocated to industrial forestry under private control. The fragile boreal forest, until now not subject to extensive harvesting, is to become a dedicated supplier of virgin fibre to the global information economy.

The rapid commitment of the Western boreal forest to large-scale pulp mill developments has aroused growing political controversy, with proponents of economic development pitted against a variety of environmental groups. There are a number of sources of economic and environmental concern. It is not a simple contradiction between pro- and anti-development forces. Northern pulp mill development promises stable job creation, but will impact on fishing, trapping, tourism and other resource industries on which the Northern economy is dependent. The bleached kraft method of chemical pulping will dump thousands of cubic metres of highly toxic effluent containing organochlorines into Northern rivers every day. Once in the river system, the organochlorines, which are slow to break down naturally, can work their way into the productive commercial and sport fisheries and other aspects of the Northern ecosystem.

Also potentially at risk is the Northern frontier of Canada's grain farming belt, which may be vulnerable to water-borne pollution.

Heavy logging, including clear-cutting of the slow-replenishing boreal forest, is another source of concern. Logging will have an impact on wildlife habitats protected by the forest in ways not fully understood. Aboriginal populations in both provinces are dependent to some degree on hunting and trapping in the slow-replenishing boreal forest, toxic effluent (organochlorines) into receiving waters, and disruption of fish and wildlife habitats and the trapping, fishing and tourism industries dependent on them. At the same time, many Northern community leaders, including leaders of Native bands, expressed cautious support of development plans and some frustration at environmental opposition. The potential for job creation which large pulp mills offer the Northern economy must be balanced against their impact on the future sustainability of traditional Northern activities.

Other concerns are more directly related to the political economy of resource dependency. It is an open question how much Manitoba and Alberta will benefit from the large-scale export of a resource in semi-processed form, and consequent overdependence on a single resource staple. Diversification may be little more than a new form of dependency. Ever since the Churchill Forest Industries fiasco of 1969, it has been evident that Manitoba was determined to develop its Northern forest resources as a counterweight to its dependence on the declining wheat economy (Mathias, 1971). Pulp mills along with hydro and mining projects, would be the prongs of a new Northern economic frontier. Alberta has sought to mitigate its oil and gas dependency. Large-scale pulp exports, however, accentuate the position of both provinces as resource suppliers to a highly competitive global marketplace. They become highly sensitive to a variety of factors currently impacting on the world market for pulp and paper, including new sources of supply from the fast-growing tropical rainforests and limitations on demand stemming from efforts underway to conserve and recycle paper. Recently, there has been a distinct softening in world demand for forest products.

Furthermore, while modern pulp mills are expensive to build, they create relatively few permanent jobs in comparison with their capital cost. They rely heavily on mechanization and automation to maintain efficient operations. Skilled and craft jobs often go to Southern immigrants rather than Northern and Aboriginal residents. The initial Repap expansion and conversion, for example, will not increase permanent employment despite higher output. Employment expansion will only come with the construction of a new supermill some time down the road. We can ask whether it is worthwhile to place our Northern forests at risk for only modest employment gains.

Environmentalists have raised a number of ethical and non-economic issues in their opposition to Northern pulp mill development. "Sustained yield" which the industry offers as evidence of its

commitment to replenish the forests as they are cut down is rejected as too limited in scope, for the forest is maintained solely as an economic resource. Instead, environmentalists interpret "sustainable development" to mean the long-term coexistence of a number of economic and non-economic activities within the forest ecosystem, including the sustenance of wildlife habitats and the absorption of carbon dioxide from the earth's atmosphere. In addition, concerns have been raised about excessive consumption of paper, especially bleached paper, and its contribution to the problems of solid waste disposal.

At the same time, the Northern Prairie region is desperately short of permanent, well-paid jobs. Census data from 1986 for Manitoba show that the mid-North region surrounding the Repap plant is on average younger, poorer and more Native than the provincial average. The town of The Pas had a population of 8,000 in 1986, of which 2,000 resided on nearby Indian reserves. Average household income was $32,000 in The Pas, but only $16,000 in The Pas Indian Band. Repap is the dominant local industry, employing 620 wage and salary workers and 240 seasonal and contract workers out of a local labour force of just over 3,000, and a regional labour force of just under 5000 (Diswinka et al., 1988).

Any initiative that promises to stabilize that labour force and eventually expand it is bound to be greeted positively in the community. Hence local business has greeted the Repap expansion enthusiastically, and the Native leadership from The Pas Indian Band and Swampy Cree Tribal Council has been cautiously optimistic. In the hearings conducted by the Manitoba Clean Environment Commission, some residents of The Pas expressed opposition to environmental concerns emanating from Winnipeg and other urban centres. In their view, environmental monitoring should be the responsibility of Northerners with a commitment to the region, rather than vocal intervenors from the South.

However, while Repap is the dominant employer, it is not the only industry in the area. The local economy is also dependent on a number of other resource industries, notably trapping, fishing, tourism and grain farming, with competing claims on the fragile Northern resource base. The fishery will be used as an example. Information supplied by the Freshwater Fish Marketing Corporation, a federal agency based in Winnipeg, indicates that the area supports 100 licensed commercial fishers, each employing one or two assistants. Average annual catch is about 400,000 kg of walleye, pike and other quota species worth about $500,000. There is also a large domestic fishery for Natives and a growing sport fishery. Spokespersons for the fishery have raised concerns about the impact of pulp mill effluent on fish health and quality, especially as some of the best areas are located downstream from the plant. Similar concerns have been raised by spokespersons for other resource industries, notably trapping.

Analysis of the submissions and transcripts before the Manitoba Clean Environment Commission indicates that for Manitobans in the region of The Pas, the major issue was not development versus no

development, but rather the future sustainability of traditional Northern activities with competing claims on the resource base. In sum, is extensive logging and pulping compatible with continued multiple use of the forests, land and water? Fishing, farming, hunting, trapping and tourism all depend on the same lands and waters as are to be committed to industrial forestry. The key question for many Northerners is the future sustainability of these alternative activities as the region is inexorably drawn into the global economy. As an expression of this concern, there were demands by local residents for the creation of an official body to ensure some degree of local monitoring of Repap's environmental impact, a demand endorsed by some of the most enthusiastic local proponents of development.

These concerns were quite different from those expressed by Winnipeg-based environmentalists, who, as mentioned above, tended to endorse a very different and more abstract set of environmental values. Submissions before the Clean Environment Commission by Time to Respect Earth's Ecosystems (TREE), an umbrella organization of environmental groups, emphasized the unique role of the boreal forest in the Northern ecosystem, our inadequate knowledge of that role and the potentially destructive impact of industrial logging and pulping. The role of the forest as sustainer of wildlife, carbon sink and oxygen generator to counter the greenhouse effect was considered equal to, indeed, more significant than its role as a resource for economic development. To environmentalists, logging the boreal forest for pulpwood is to acquiesce to a destructive cycle which places our forests at risk due to overconsumption of paper, most of which ends up as solid waste. This represents the environmental dark side of an information society.

CONCLUSION

From the point of view of political economy, Repap and other new kraft mill projects slated for the Western boreal region are geared to economic development through the export of natural resources to metropolitan markets outside Canada. Information industries in the United States, Japan and other nations will benefit, while the boreal region will run the risk as it is inexorably drawn into the global market economy. Vast tracts of Crown land in Manitoba and Alberta have been turned over to management by foreign and domestic multinational forest corporations. This raises questions about the future of activities with competing claims on the forest and water resources of the boreal region, and of Northern communities dependent on such activities. Do such pulp and paper megaprojects diversify the local economy or accentuate dependency? For much of this century, the future of the Canadian economy has been linked to large-scale development projects geared to the harvesting and export of natural resources. Given growing concern about the impact of such projects on the environment as well as their long-term economic value, this linkage needs careful examination.

Political economy serves a useful purpose because, unlike other theories of economic development which stress such factors as labour, information or human capital as generators of growth, it has taken resources seriously as a factor in the wealth of nations. This makes the political economy perspective valuable in a discussion of sustainable development. Indeed, other perspectives, by not dealing with the land and resource issues, have obscured our dependence on and misuse of the environment. However, the political economy perspective is deficient in viewing the land and natural resources as commodities in the global economy and as generators of growth. An ecological perspective will have to go beyond this, and question the reduction of the environment to a series of commodities and inputs to production and world trade. In the Repap hearings in Manitoba, environmentalists have taken this step by tracing the linkage between the boreal forest and other biotic systems on the planet.

The Brundtland Commission has argued that "sustainable development" allows for continued economic growth along with conservation. This may be accomplished in part by shifting the economic base of advanced nations to information and service activities--the sorts of activities which are usually associated with cities and urban life. This shift would allow urban activities to be placed on a sustainable basis. However, an ecological approach to sustainable development should be more holistic.

That is, it needs to be recognized that concentration of information-related activities at the centre creates problems for the periphery containing the desired resources to supply the centre. The example of pulp and paper's role in an information society demonstrates this situation well. The demand for resources from the periphery--forests for paper, flooded land for hydroelectricity--illustrates the key role people in urban centres play as consumers and end users of resources. Thus, a mere conservationist approach does not suffice. Rather, urban ethics must be taken into account within an ecological or environmental approach.

> Environmentalism is an ideology which has developed in part out of the ideas of the earlier conservationist perspective. First and foremost it is of note . . . that environmentalism has a far more urban focus than did (or does) the conservation movement (Paehlke, 1986, p. 1).

Consequently, there is a necessary urban orientation to the ecological perspective, for urbanites influence people inside as well as outside their immediate setting.

The concentration of wealth at the centre makes the periphery dependent upon environmentally risky megaprojects, such as pulp and paper supermills or vast hydroelectric dam projects. Such undertakings may provide some short-term economic benefits for the hinterland regions, but place the environment at risk and increase the dependency of the periphery on the centre. This type of unstable relationship, drawing the hinterland's human and natural resources into increased dependency on the centre, is not what environmentalists have envisioned as "sustainable development."

NOTES

1. Much of the material provided concerning Repap is based on transcripts of Clean Environment Commission Hearings conducted between August and September of 1989 (Hearings, Repap Manitoba, 1989).

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THE RESPONSIBILITY OF URBAN DWELLERS TO FOSTER SUSTAINABLE RURAL COMMUNITIES

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INTRODUCTION

The concept of "sustainability," which we define as "meeting the needs of the present without compromising the ability of future generations to meet their own needs," has only recently become a "catch-phrase" in our society, and as yet there are no existing models to help simplify and explain this notion.[1] Sustainability has, however, most particularly been associated with the "ecological world" (the "environment"), and as a consequence some important dimensions have been neglected or lost in many discussions.[2] One such dimension relates to the small communities which are, by their nature, an integral part of our environment,[3] and in this context, two major concerns will be addressed, namely the *quality of life,* which:

> Includes the tangible health, well-being and aesthetic benefits, as well as the more tangible economic/employment benefits, arising from maintaining or improving the quality of the small community . . .

and, secondly, the issues of *inter-generational equity*, which includes:

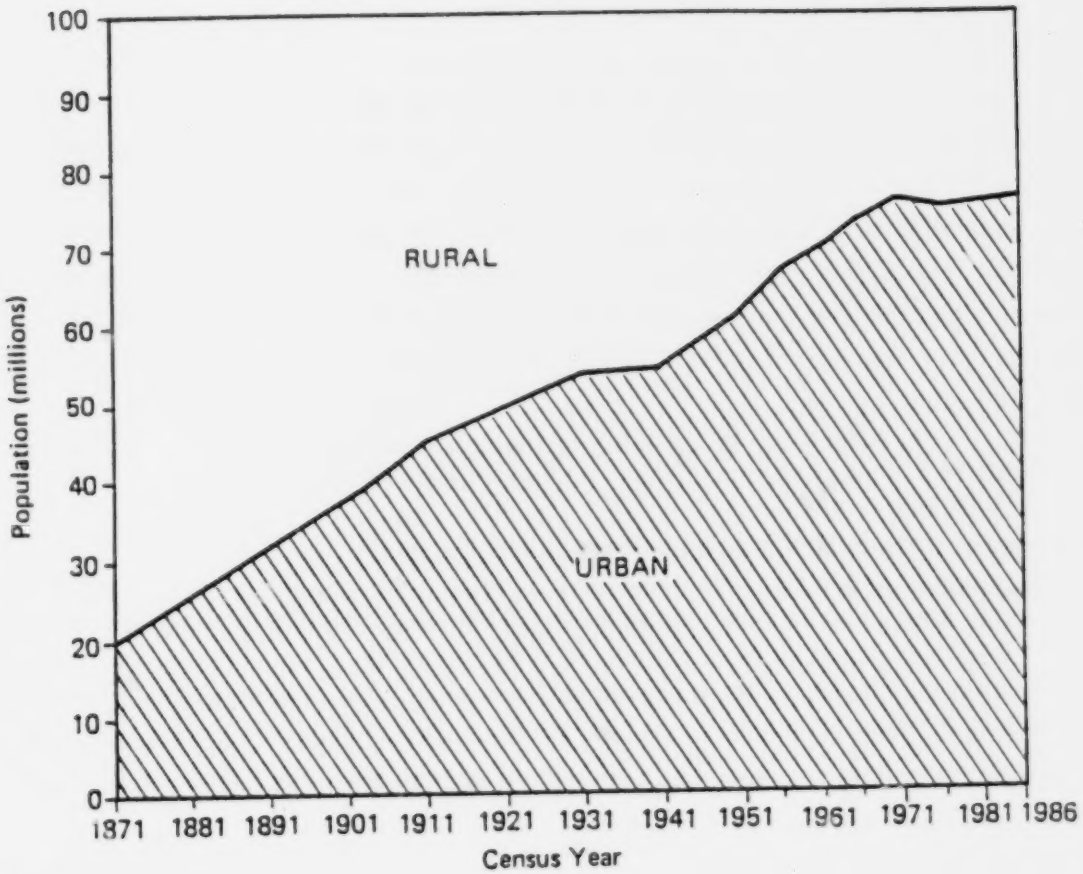
> Undertaking the development and management of the small community today in a way that ensures its future availability as a high quality environment for generations yet unborn.[4]

In particular, this paper will be concerned with the question of sustainability of small communities on the Prairies, especially in Manitoba. Perhaps more accurately, we shall consider the sustainability of *what are left* of these Prairie communities, as many have already disappeared, or are on the verge of extinction. Our paper will address the four questions that are central to this theme:

1. Why sustain rural communities?
2. What threats exist to rural communities?
3. What are the trends and concerns? and,
4. Whither rural communities?
   - Where do we go from here?
   - What are some of the solutions?
   - What recent progress has been made in Manitoba?[5]

Figure 1

Rural Population as Percent of Total Population, Canada, 1871-1986



Source: Fuller et al.: 12.

QUESTION ONE: WHY SUSTAIN RURAL COMMUNITIES?

The Canadian economy and society were traditionally based upon land, and upon the rural communities of this land. Although an increasing proportion of the population of Canada has become urban over the years (Figure 1), a significant number of people still live in smaller settlements, many of which are under threat.[6] For example, in Manitoba in 1986, there were 76 incorporated settlements, 46 percent of which were exhibiting a declining population. Saskatchewan had nearly 500 incorporated places (48% of which had declining numbers), and in Alberta 45 percent of the nearly 250 incorporated settlements had declining populations.[7]

What differentiates Waskada from Winnipeg, and Teulon from Toronto, however, is far more than just the size of the community and whether it is growing or declining in numbers. There is also a contrast in the subcultures that inhabit these different communities. Although undoubtedly the very well-documented and classic "*Gemeinschaft-Gesellschaft*" dichotomy has been eroded in the past few decades by improvements in such services as transportation and communication, it still does exist to some degree, and undoubtedly more in Manitoba than in Ontario, where the "dispersed city" (or "spatially extended city") is more apparent.[8]

The question of the "sustainability" of small Prairie communities can be approached with two quite different options or outcomes in mind, although perhaps these are best viewed as points along a single continuum. The first option for some of these communities is to be sustained "as is," but with a vibrant economic and social life and a sense of community well-being, and the second is to be sustained at a "higher level."

With these options in mind, the question can now be posed as to why we would wish to sustain rural communities. We see seven major reasons why it is important to maintain and enhance our rural communities:

1. Perhaps the most important reason is that we should, as sentient human beings in a multicultural country and world, attempt to retain, promote and sustain as many alternative lifestyles as possible. To us, this is an ethical argument, dealing as it does with "what is good and bad with moral duty and obligation,"[9] but also it seems to be only common sense to keep our options open. In a country that promotes multiculturalism and bilingualism, it seems only right to preserve a valid alternative for future generations, even if this alternative is one that is used by only a minority of the population.
2. An argument can be made for the *validity* of this lifestyle. If it is dying "naturally," perhaps it should be allowed to "Rest In Peace," but we think not:

> People are the most important "product" of community development. Improving their lives and building their citizenship capacities is the primary objective of sustainable development. The bottom line must be environments in which people can thrive.[10]

Not everybody can thrive in large cities. There has to be a viable alternative, namely the smaller community, which has the added advantage of what many feel is a *better* lifestyle with a closer-knit community, despite a number of counteracting disadvantages related to housing, transportation and services.[11]

3. Added to this are some economic arguments. Economically, we currently have a large investment in a rural infrastructure. If this declines and more and more people move to the cities, then new infrastructures will have to be built, and this is bound to be a more expensive option. If people can be sustained in small communities, it may well be *cheaper*, as well as retaining alternatives. In this context, we might compare the idea of downtown redevelopment in Brandon or Winnipeg. It is better for the life and economies of these cities to have vibrant and useful downtowns rather than the "holes in the doughnuts" that have to be maintained at great expense by other city taxpayers. In our argument, the small communities are like the downtowns, potentially in decline and in need of help. The rest of the "doughnut" represents the larger urban centres which must help the "hole" in order to help themselves.

4. We believe that there may well be some ecological benefits to retaining rural communities, although there are few "hard data" on this topic at present, and our comments are thus tentative. One such benefit could lie in the better use of fossil fuels, and particularly gasoline. As people living in small rural communities will have proportionately less "stop-and-start," "congested city" driving, and proportionately a greater amount of more efficient, longer-distance driving, their use of gasoline should be more efficient. They may also find it easier to reduce overall automobile use, and sustain themselves with other alternatives that are likely to be more environmentally sound.[12] If this is true, it could have a number of other impacts on, for instance, pollution and acid rain, and even global climate change. Rural communities also have the capability of being more self-sufficient in terms of food production, and thus of becoming an integral part of a "sustainable society."[13]

5. We have to recognize that we live in a system, and the actions that take place in one part of the system potentially affect all of the other parts. Even if urban dwellers do not "use" small communities, they *need* them in order to make the system work at its most efficient

level. This pattern of thinking, is, of course, reflected in the whole of the "Green," or "Conservation," or "Sustainable Development" movements.

6. A further "environmental protection" argument for sustaining rural communities relates to the "small is beautiful" idea, but adds to it another important dimension. If the Prairies were one large, depopulated agricultural machine, pocked with large cities every few hundred kilometres, it would be easier for a few people (or corporations) to threaten the environment, as there would be nobody out there to "look over it," and guard and sustain it, for future generations. This is not to suggest that Prairie farmers have never threatened or degraded their environments over the past century, but rather it reflects our fear that the situation could well deteriorate if the "owners" of this environment did not live in it.

7. A variation on this theme is that urban residents need to help sustain rural communities in order to protect their source of food. We perhaps rarely realize that our meat, bread, pasta, etc., come from Prairie farms, even though it is made very clear to us by the supermarkets that the fruit and produce come from Texas and Florida. If we want to keep farmers on the land to produce this food, we must remember that they need such amenities as schools, churches and social services, as well as groceries and tractor parts. The very small places can provide a sense of community for surrounding farm families, even if they cannot provide social and commercial services. The ability to provide this sense of community is part of our concept of sustainability.

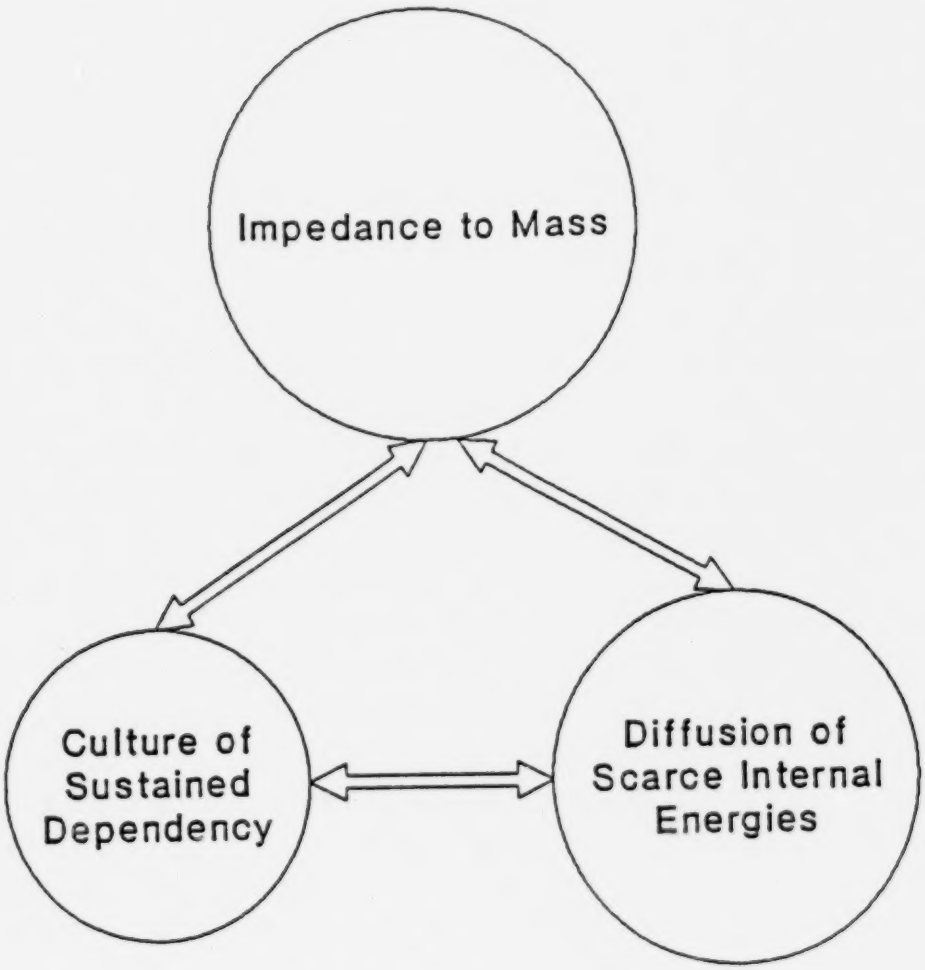
In conclusion, we can see that there are many reasons for sustaining the rural community, but under the present global system, and that of our country, the sustainability of these small communities will not come without some short-term economic cost. On a purely financial basis, we might say that no investment of funds in such "sustainability" is one option, and a "bottomless pit" is the other end of the continuum. Where do we think that the answer lies? How much money should be invested in sustaining small communities? Well, we do not know, although we do believe that the economic costs *can be* reconciled with the advantages of maintaining the integrity of small communities.[14] If it is an ethical question and not a purely financial one, the answer is easy, but life is never this simple. It is up to Canadian society to decide where the fulcrum between ethics and bottom-line economics must lie.[15]

QUESTION TWO: WHAT THREATS EXIST TO RURAL COMMUNITIES?

The sustainability of small communities is a battle fought not on one front but on many. A major threat comes from the fact that the Prairies are in many ways like a developing nation, acting as a hinter-

Figure 2

Rural Community Viability: Nexus of Vulnerabilities



Source: Douglas 1989 (i).

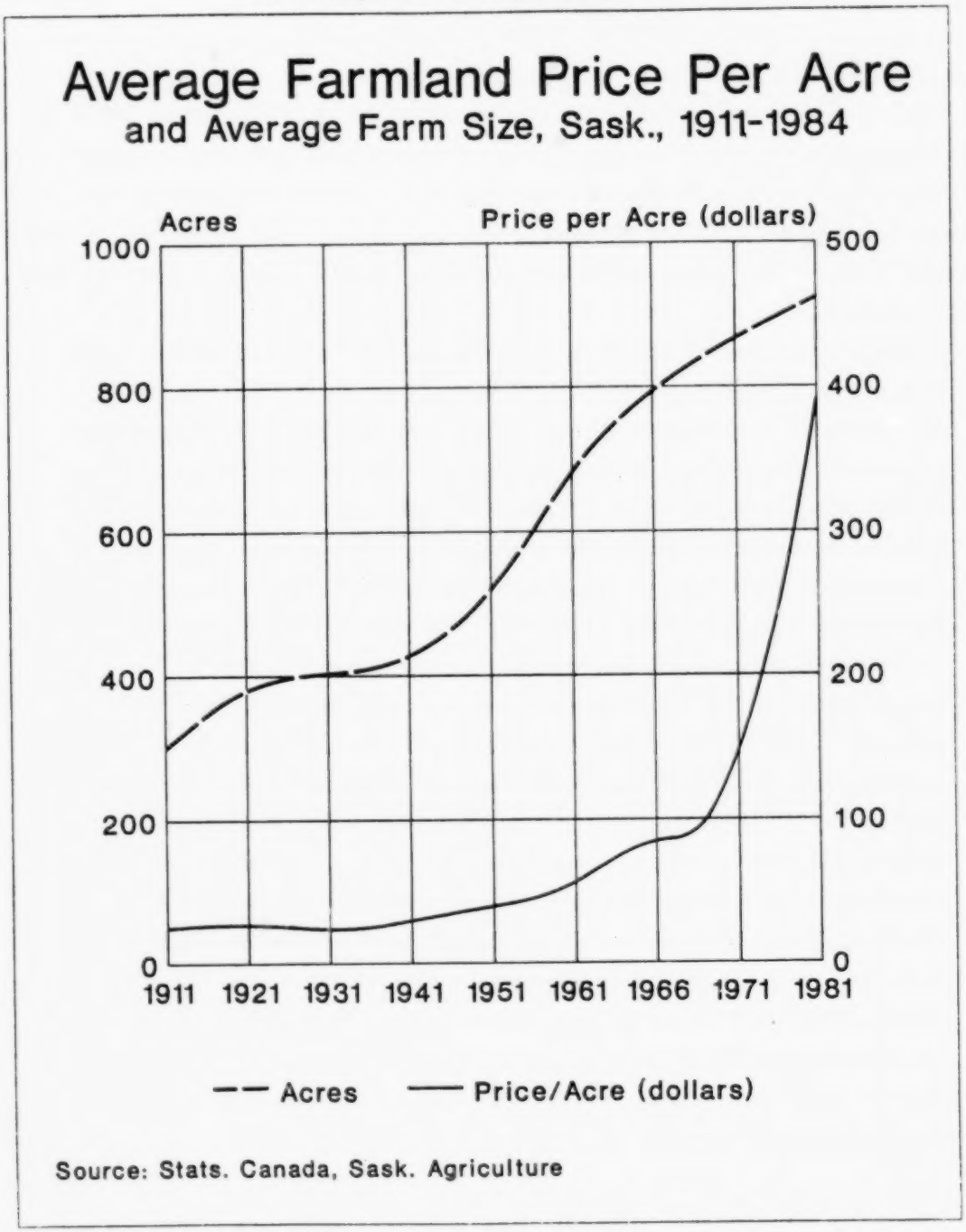
land producing primary products and controlled by the heartlands of Central Canada, Europe and the United States.[16] Recent battles over railway abandonment, railway passenger service reduction, free trade and suchlike have made it clear that the Prairies are dominated by external forces which, if not countered by a concerted effort from the "grassroots" as well as the higher levels of government (i.e., "bottom-up" *and* "top-down"), will lead to the further decline and destruction of the small community.

In the Canadian context, there has been little work done to explain the particular vulnerability of many small settlements to change which "undermines or destroys the community's *raison d'être* and eventually its actual existence." The paucity of theory in this area is lamentable, but one attempt which has been made is by David Douglas (Figure 2).[17] He suggests that there are three interconnected propositions (a "nexus") that must be faced and dealt with in order to give small rural settlements a chance at sustainability.

1. Douglas identifies a problem of the extensive diffusion of scarce internal energies within a community. These may be political, organizational, economic and other energies, and the net effect is an inability to "decode" and come to grips with externally-generated opportunities and threats. On occasion, this can mean that there is an uncritical acceptance of some information and apparent opportunities, and that longer-term priorities are prejudiced in favour of apparent shorter-term gains. Consequently, sustainable initiatives are rarely undertaken. This problem reflects the lack of trained personnel at the disposal of rural communities, as well as their inability to communicate quickly with other communities that might find themselves in similar situations.[18]
2. Douglas points out that some of the fundamental characteristics of "rurality" (such as smallness, splintered governmental structures, distance from other centres and competition with potential partners) militate against the viability of rural communities, particularly any sustaining initiatives. He summarizes these characteristics as an "impedance to mass," by which he means that the lack of a dense population causes rural communities to be vulnerable to a number of potentially dangerous outside influences. The challenge for rural communities is to gain mass "through communications (especially horizontal), new coalitions, inter-municipal collaborative structures, innovative networks and so on."[19] Such initiatives can reduce rural community vulnerability resulting from this lack of "mass," but they cannot eliminate it. The Eaton Centre in Toronto or Portage Place would never have been built in Melita or Hamiota, or even Brandon. But sustainability *can* be improved.

Figure 3

Average Farmland Price per Acre
and Average Farm Size, Saskatchewan, 1911-1984



Source: Stats. Canada, Sask. Agriculture

3. A condition (or culture)

> of sustained dependency exists which is both internally as well as externally nurtured. Fortified by historical practice, accepted wisdom or received convention, as well as a self-image of vulnerability and external dependence, a community culture of inertia and one-way dependency is fostered and perpetuated. This not only detracts from the efficacy of indigenous or internal initiatives, but constantly places the community in a reactive posture responding to Federal, Provincial or Territorial government programmes and priorities. Vulnerability is exacerbated not only by exposure to the vagaries of so-called senior government funding priorities, but by the inattention to and the consequent creeping erosion of indigenous entrepreneurship.[20]

As a consequence, the capacity to develop community-responsive or customized initiatives is abridged, thereby jeopardizing any attempts at sustainability, let alone viability.

To conclude, we should also emphasize that Canada has not really had a policy covering the sustainability of small communities.[21] Only recently has there been some evidence that this is entering into the political agenda.[22] The country's traditional response has been one of *laissez faire*, with some "crisis management" thrown in when necessary.[23] This policy is perhaps appropriate if *economics* is the driving force, but it is not palatable if considerations regarding the quality of life are given credence.

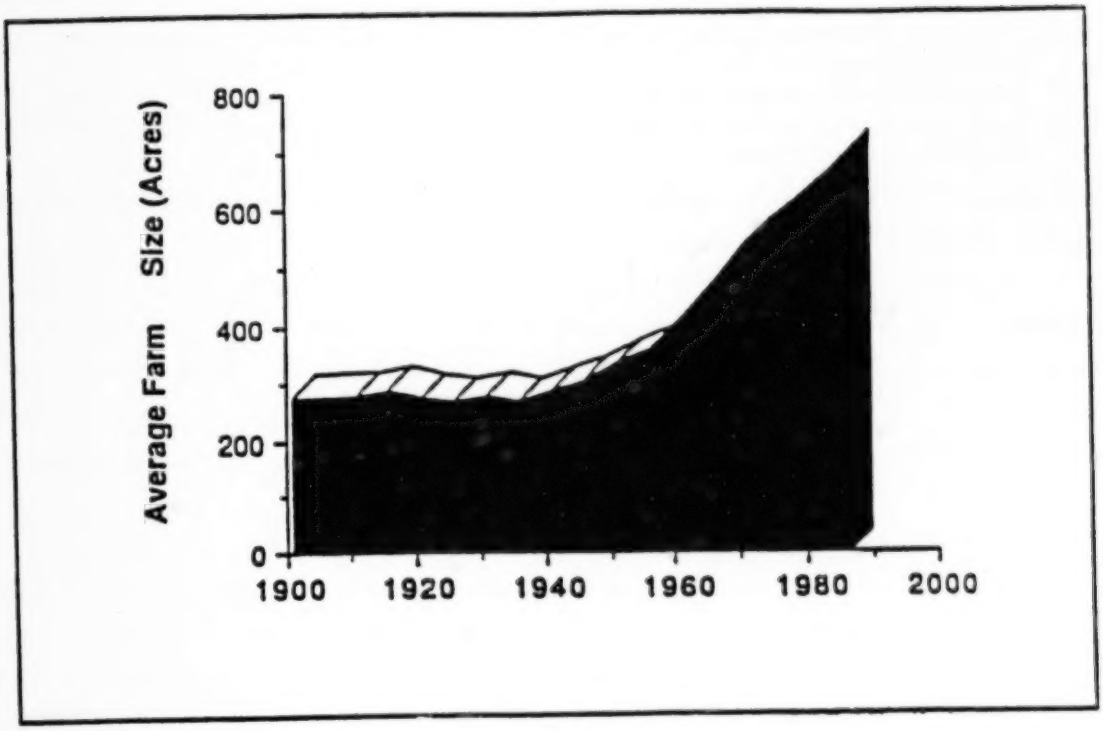
QUESTION THREE: WHAT ARE THE TRENDS AND CONCERNS?

The social, demographic and economic changes occurring in rural Manitoba are complex, as they are a consequence of a large number of inter-related factors, not of any single influence. This is what makes small community issues so difficult to understand and resolve, and to project the outcome of these trends into the next century is an even more complicated exercise. More research will undoubtedly be needed before any satisfactory resolution is reached. However, some points are clear. For instance, although most rural communities owed their genesis to, and were dependent upon, agriculture,[24] now, to a large extent, this dependency has been reversed, and the viability of many farms is dependent upon the economic health of nearby communities. This new reality can be seen in many statistics:

1. An increase in the price of land and in average farm size, coupled with a decrease in the number of farms and a decrease in land ownership (Figures 3, 4, 5 and 6).
2. A reduction in the farm population as a proportion of the total rural population (Figure 7), coupled with a reduction in the farm labour force.
3. An increase in the need for off-farm work in order to maintain the family farm (Table 1, Figure 8).
4. An increase in the proportion of farm families with relatively low incomes, and particularly, low incomes from agricultural sources (Figure 9).

Figure 4

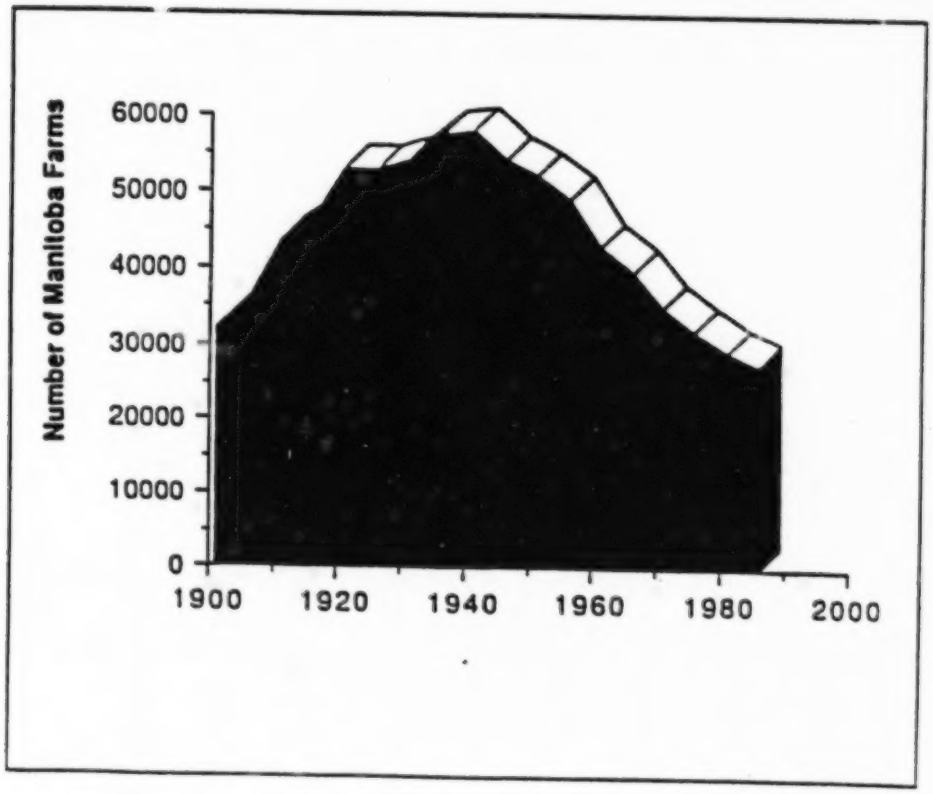
Increases in Average Manitoba Farm Size



Source: WESTARC Group Inc.

Figure 5

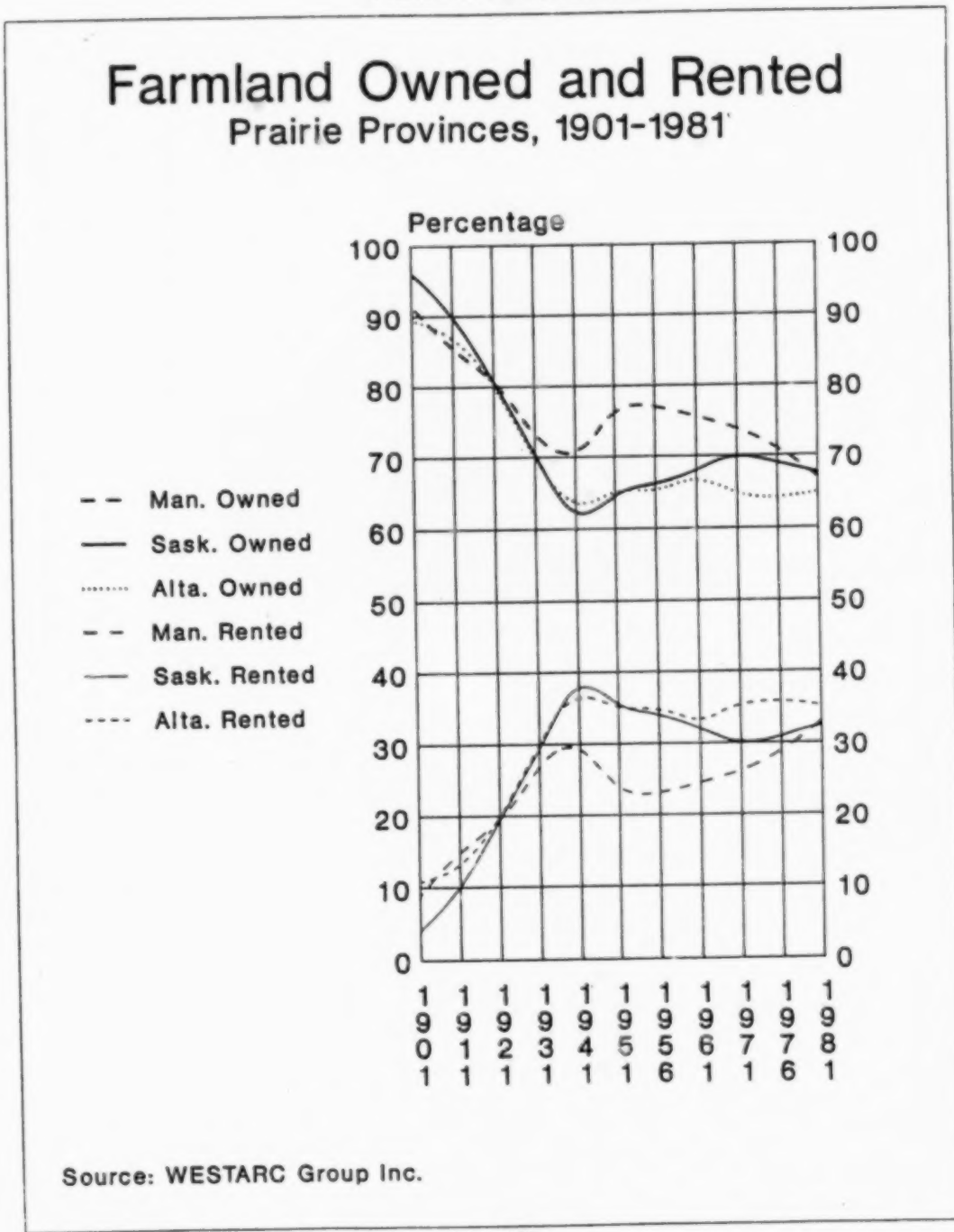
Number of Manitoba Farms 1901-1986



Source: WESTARC Group Inc.

Figure 6

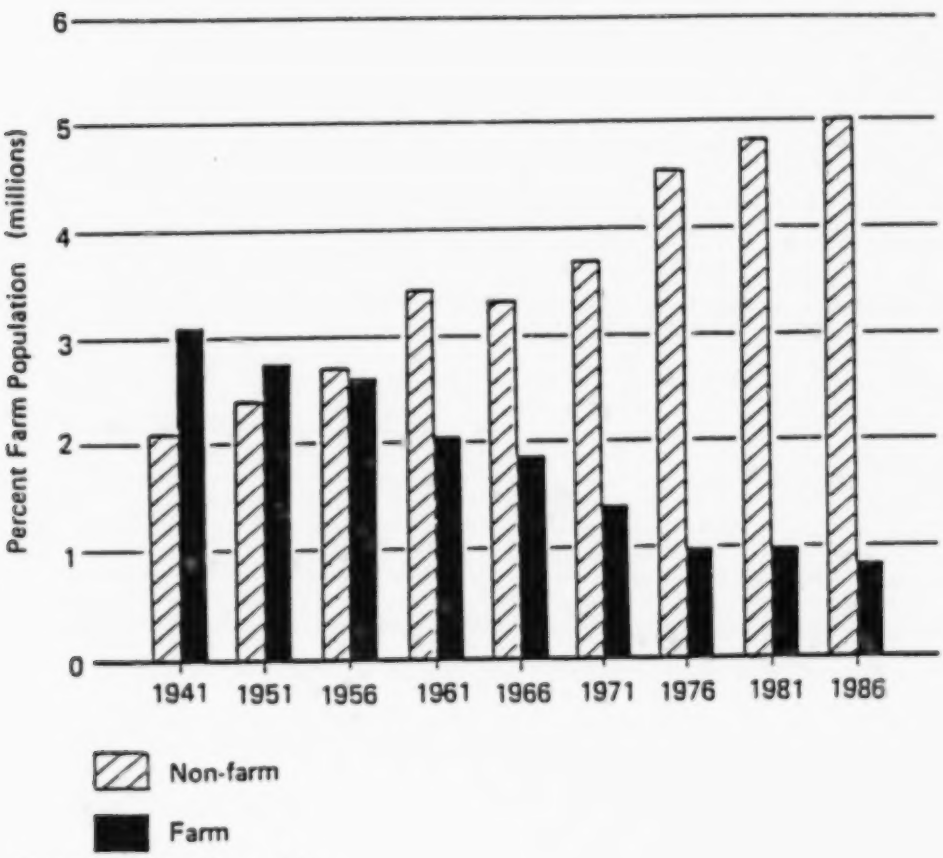
Farmland Owned and Rented:
Prairie Provinces, 1901-1981



Source: WESTARC Group Inc.

Figure 7

Farm Population and Total Rural Population, Canada, 1941-1986



Source: Fuller et al.: 13.

Table 1

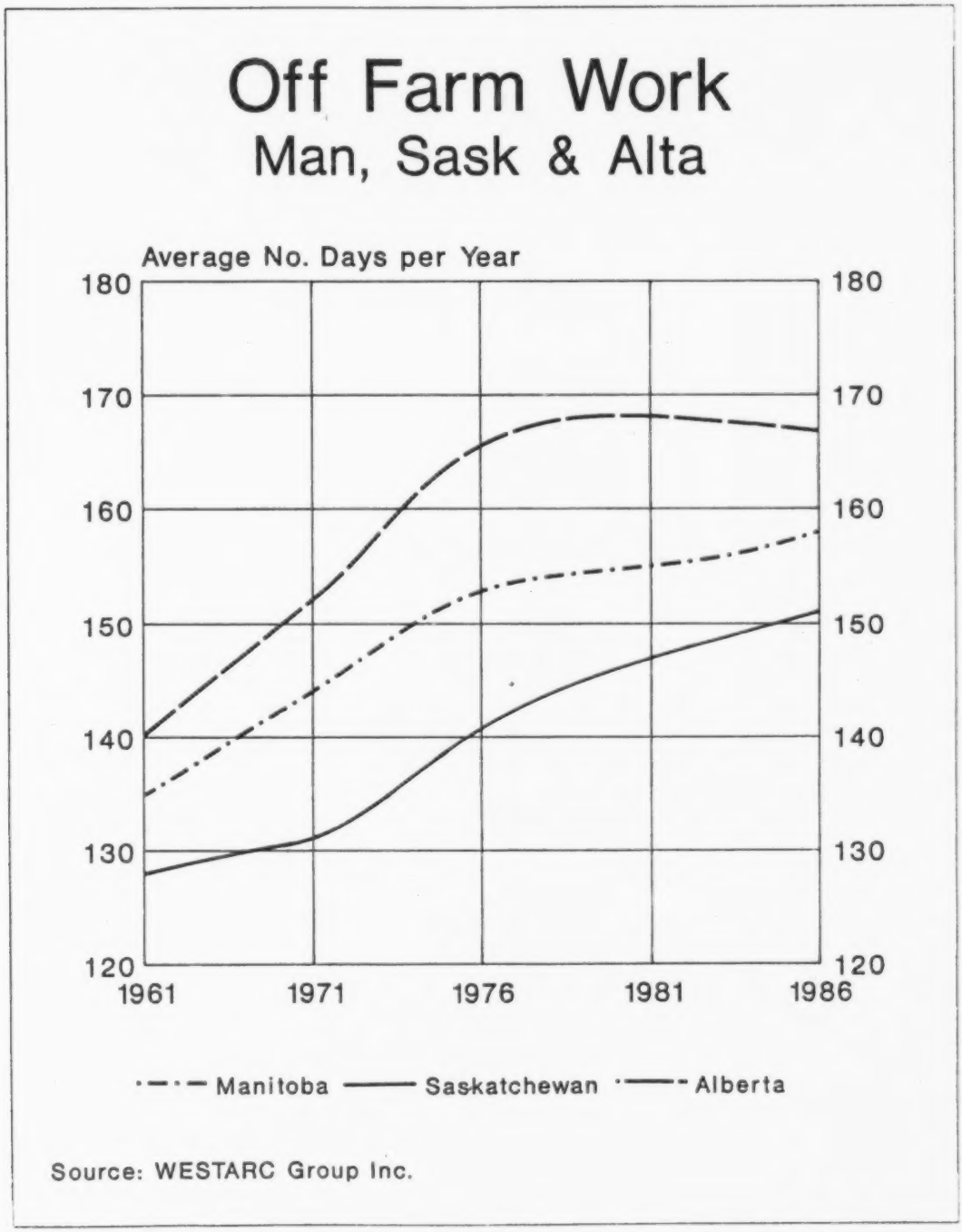
Off-Farm Work in Manitoba

Year	Working Off-Farm	Average Days Off-Farm Work/Year
1961	24.3%	135.2
1971	30.9%	142.6
1976	28.9%	155.5
1981	35.4%	154.3
1986	35.5%	158.2

Source: WESTARC Group Inc. Data Source, Censuses of Canada.

Figure 8

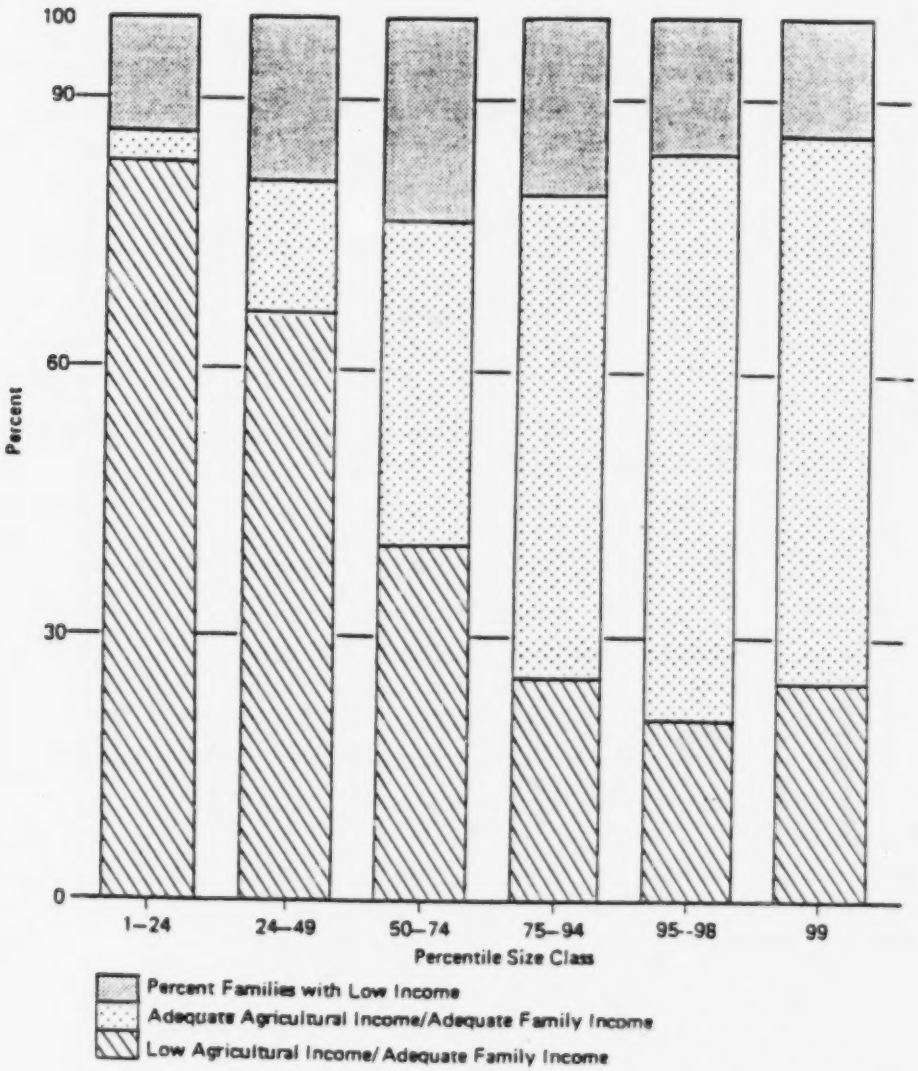
Off-Farm Work: Manitoba, Saskatchewan and Alberta



Source: WESTARC Group Inc.

Figure 9

Proportion of Farm Families in Different Viability Categories, By Farm Size, Canada, 1986



Source: Fuller et al.: 35.

Figure 10

Percentage of Seniors: Canada, Manitoba and Saskatchewan, 1986

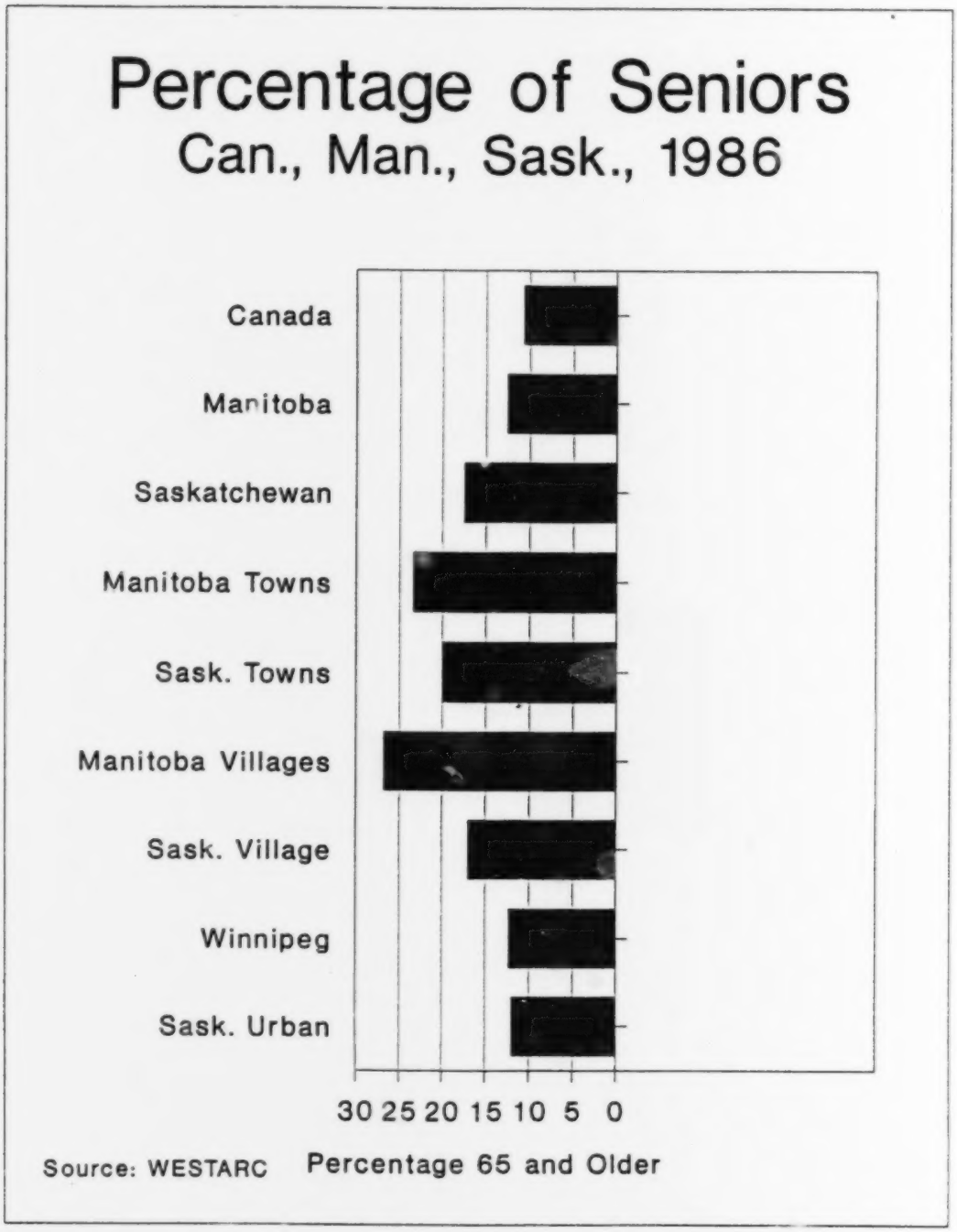
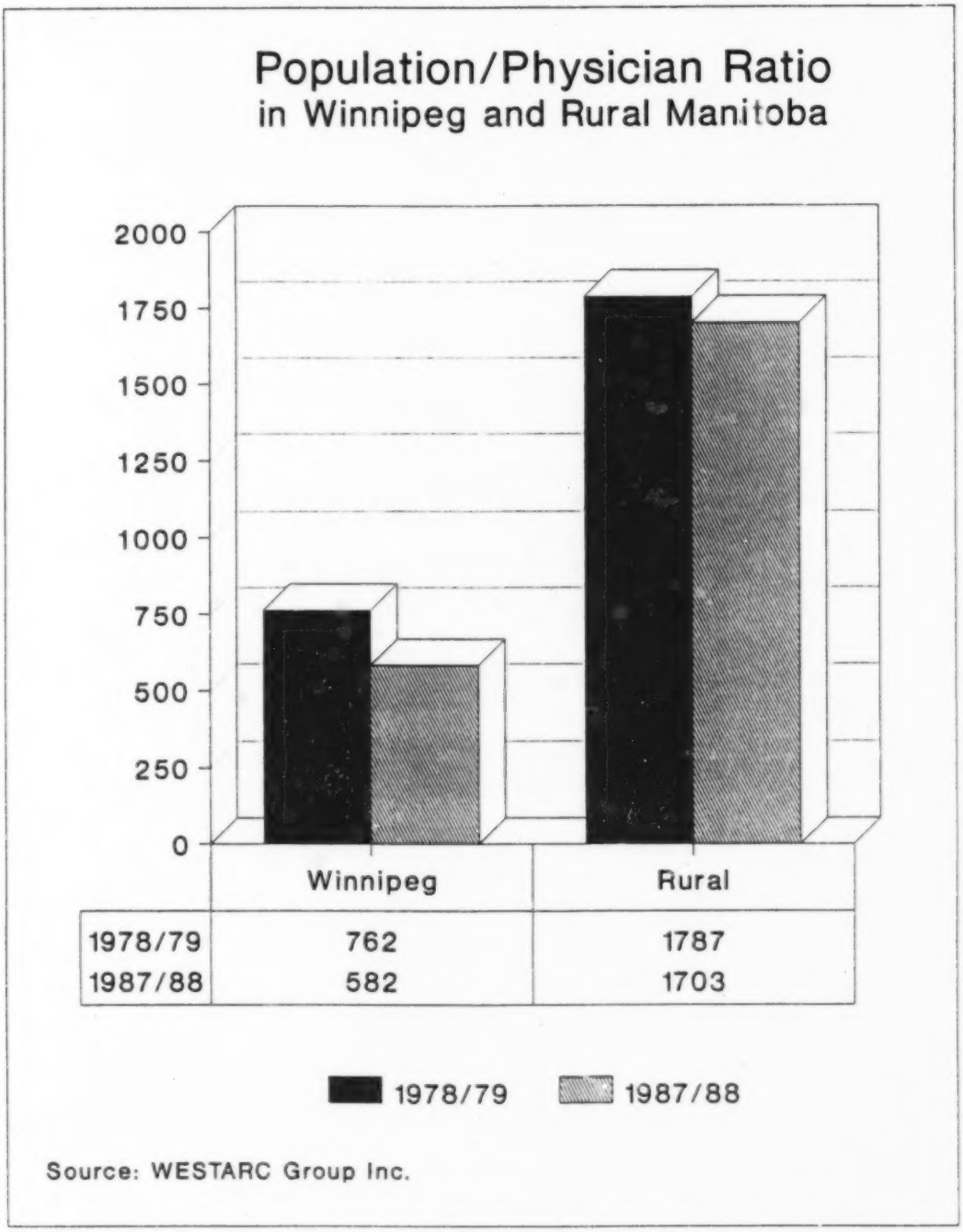


Figure 11

Population/Physician Ratio in Winnipeg and Rural Manitoba



Source: WESTARC Group Inc.

Figure 12

Distribution of Physicians in Manitoba, 1989-1990

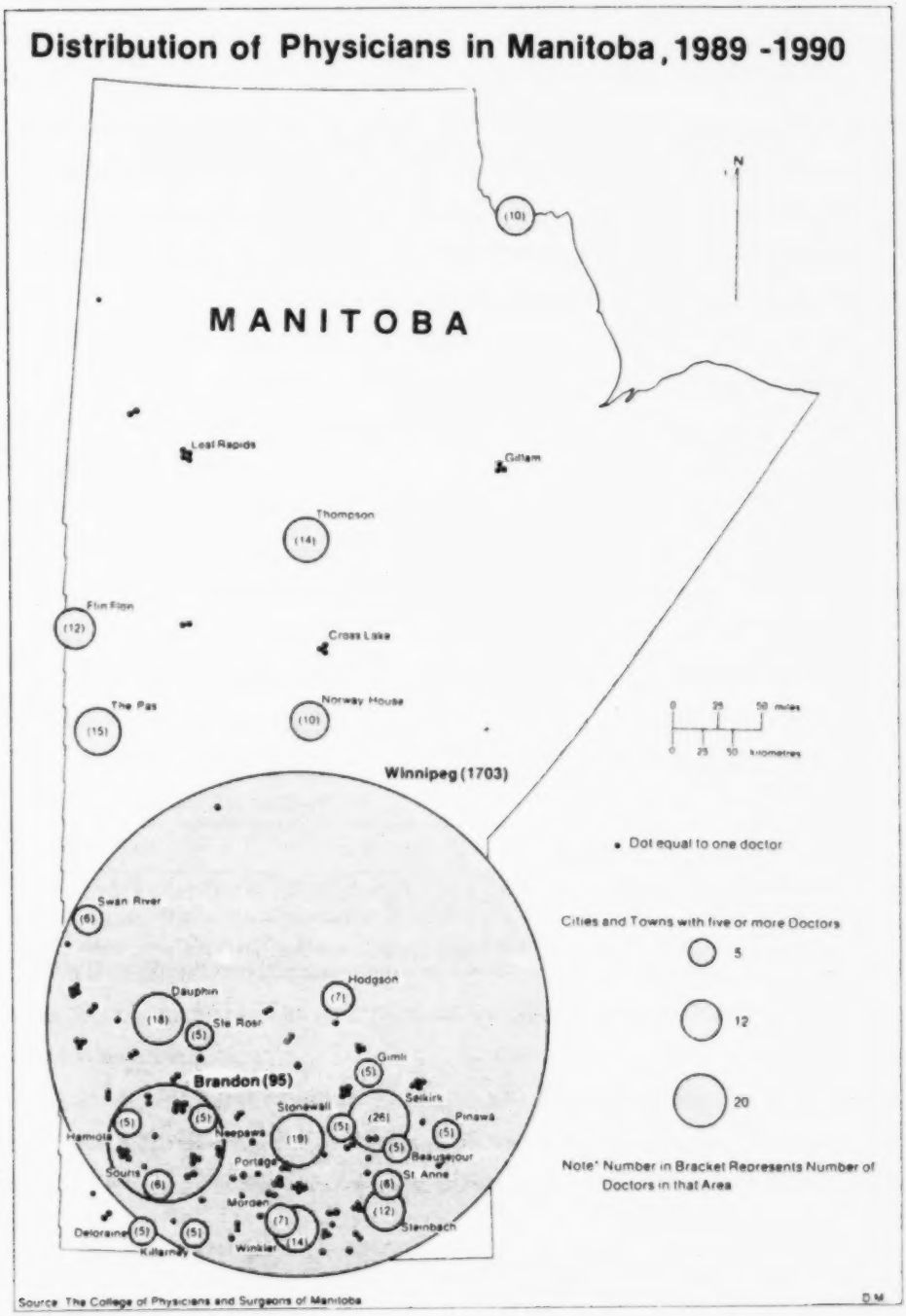


Table 2

WESTARC's Rural Community Sustainability Check List

1.	Community pride and community spirit.
2.	A demonstrated willingness to invest in the future of the community.
3.	A participatory approach to community decision-making.
4.	Local media which encourage diversity of opinion.
5.	A realistic appraisal of opportunities.
6.	An active economic development programme.
7.	A deliberate transition of power to younger leaders.
8.	An acceptance of women in leadership roles.
9.	A strong belief in the value of education.
10.	A problem-solving approach to providing health care.
11.	A well-maintained infrastructure.
12.	Control of public finances.
13.	Good access to information.
14.	A willingness to seek help from the outside.
15.	A conviction that, in the long run, you have to do it yourself.

Source: WESTARC Group Inc.

5. An increase in the proportion of seniors in the population both due to our aging population within the country as a whole, and to the flight of younger people from smaller communities (Figure 10).
6. A decrease (or at least a smaller increase) in rural services, such as schools, physicians, etc., when compared with their urban counterparts (Figures 11 and 12).

All the trends described above, as well as others, have contributed in some way to growing and dynamic large cities, and stagnant or declining small communities. However, there is some hope that, due to changes that are resulting from the new economics of agriculture on the Prairies, rural landscapes are likely to exhibit greater diversity than they do now, and in particular, a reduction in wheat-crop dominance. These more diverse landscapes may better serve (and need) small communities, and thus require their sustenance in the present, in preparation for the demands of the future.

QUESTION FOUR: WHITHER RURAL COMMUNITIES?

Where do we go from here?

Let us now turn our attention to some factors which may help sustain the small community. A key point to bear in mind is that agriculture can no longer be looked upon as the mainstay for small settlements, and thus we must be prepared to "turn our backs upon history," as few of these settlements had their origins in anything other than the agricultural sector.

One key feature is *local* involvement in any initiative, and this involvement would include:

- Human Resources
- Financial Resources, and
- Ideas/Information/Technology

As Howell has noted:

> . . . the vast majority of communities have within themselves and within their grasp a considerable capacity to develop. It is attitude that ultimately makes a difference. . . . I have never seen a rural area, a cluster of rural counties, or a city in America that failed because of excessive boldness.[25]

But, and this is a big "but," even then, change will most likely be slow: instant transfusions of success are few and far between.

Another feature is that there has to be a better marriage between "top-down" and "bottom-up" approaches. Rural Community sustainability needs some external help, but a much more critical need is *collective* rather than *individual* responses at the local level. We will return to this point in more detail later.

It follows that there *is not* and *should not be* a "blueprint" that is applied in some uniform manner to all communities. The "top-down" approach too commonly adopts such a fallacy and leads to the failure of otherwise promising programmes.

What are some of the solutions?

It is clear that the universe is not unfolding as we think it should. Therefore, what can be done about this, and what kind of actions may make a difference in a long-term effort to sustain rural communities (Table 2)?[26]

1. One of the major problems relative to the sustainability of small communities is the lack of an adequate data base to permit a precise understanding of exactly what is happening to our small towns. We need more research based upon *local* case studies, and this needs to involve local people in the research process.[27]
2. We need federal and provincial policies that are not based upon the assumption that rural communities are going to die. That is, we "shall have to redefine our concepts of political and economic feasibility. These concepts are, after all, simply human constructs; they were different in the past, and they will surely change in the future."[28] Such a redefinition should allow for local initiatives within a regional framework, and will undoubtedly cost money. If the higher levels of government would consider helping the rural communities (perhaps by stepping up the Province's rural economic development programmes), this could cut down on the depopulation which empties the small towns. Also, every family that relocates causes Winnipeg to extend its utility services, with the attendant skyrocketing costs that accompany this process. Manitoba, in its present economic position, cannot afford to continue building new infrastructure in Winnipeg, when it has more economically viable alternatives in the smaller settlements. Why should the Province duplicate such expensive infrastructure, and at the same time increase the per capita costs for services to rural residents?
3. Although the entire nation has a stake in the welfare of rural communities, we also have to get members of rural communities to invest their surplus monies (some farmers do make money!) in their own communities. Economic development is a local responsibility. Communities must avoid a "low tax ideology." They must be willing to raise taxes both to gain money and to gain a sense of empowerment. This would also enable the preservation of the rural infrastructure and discourage further out-migration. Direct public

subsidies should be limited, visible, and well-targeted. Participants must have a direct stake in a programme's success.[29]

4. Rural communities must come to define "community" broadly and gain "mass" through enhanced communications, new coalitions, inter-municipal collaborative structures, innovative networks and so on. Rural communities should view each other as co-operative neighbours rather than as competitors.
5. *Horizontal* and *vertical* networks have to be developed for channelling resources and information in order to obtain an integration of effort. That is to say, communities need to develop effective processes for responding in an efficient, focused manner to opportunities and threats. Such processes should clearly include both planning and implementation. Currently lacking are "forms of communication that connect the overarching interest of society . . . with the well-being of the individual" rural resident.[30]
6. We have to develop flexible leadership, encourage turnover in public office and the sharing of informal roles, in order to "spread the load," take advantage of all possible energies, and help to marry the "top-down" and "bottom-up" approaches.
7. We need to improve services, including education and access to medical facilities in small communities, in order to increase their attractiveness, and at the same time produce valuable citizens. A greater emphasis on formal training may be needed. It has been suggested that before long, Winnipeg will hear that the small towns are petitioning the provincial government for recompense for the "educational subsidy" each town pays to Winnipeg each year. One estimate is that it now costs $50,000 to educate a rural child from K-12. When the high school graduates move to Winnipeg, as many do, they take that rural investment with them. It represents a direct loss to the town, and a direct benefit to the capital city.
8. In order to break the chain of dependency, it may be useful to encourage sources of information of all sorts. This may sometimes be controversial. The acceptance of controversy and debate over alternatives may thus be seen as acceptable and normal rather than as something to be avoided.
9. A continuing forum for debate should be encouraged in rural communities, perhaps with newsletters produced locally to share information. Sustainable rural communities must be forward-looking communities.
10. It can be seen that most of our solutions are social rather than economic and/or technical. Many of the past attempts at "rural revival" were just the opposite. But at the same time,

we have to recognize that the sustainability of small communities is a political, and an ethical, problem. It is a problem of persuading the decision-makers at all levels adequately to consider the value of the small community over the "long haul." It is also thus a problem of educating the (majority) urban voting public of this necessity. It is a problem of making clear to decision makers that there are options, and that the expansion of the economy as a whole need not be at the expense of small communities.

11. Finally, each of us clings tenaciously to our inalienable right to live where we want, and few have any sense of personal guilt about the continuing diminution of the rural community. Each of our individual decisions may be good for us, but together they may lead to a collective calamity. Each of us has important choices to make, and the sum of these individual decisions may determine the future of the rural community. Do we preserve rural communities or not? We must decide. Sustainable development will fail if left solely to the "experts."

What recent progress has been made in Manitoba?

While our comments thus far are academic in base, and well supported by official statistics, our presentation is based upon material which is of necessity somewhat dated.

Over the past few years, there have been some events, and some political activities, which have a direct bearing on our topic. We wish to state them briefly. Because of the lack of hard data covering the contemporary scene, this discussion is not based upon academic studies, but rather on observations in the field, and current research being conducted by WESTARC Group Inc.[31] First, there is evidence of political action.

Political action.

There are several activities under way in rural Manitoba which are largely unknown to the majority of big-city residents, but may have a considerable influence upon the rural scene.

In March 1989, a major conference of rural residents was held at Neepawa. It was sponsored by the Manitoba Community Newspapers Association. It proved to be a sounding board upon which were aired the concerns of over 300 country dwellers. There were two noteworthy aspects of this meeting.

First, the luncheon speaker was Premier Gary Filmon. He pledged active support to rural residents. He promised to reverse the programme of centralization which, in recent years, has relocated hundreds, perhaps thousands, of provincial employees to Winnipeg. He also promised to give rural residents a department of their own, the purpose of which would be to strengthen the rural economy.

Within four months of that meeting, the premier had made good on one of his promises. He renamed the Department of Municipal Affairs the Department of Rural Development. While this agency retains most of its former functions of planning, assessment and enforcement, it now has the additional responsibility of designing programmes which will be of direct aid to rural Manitoba. Then, one year following his speech in Neepawa, Premier Filmon made good on his other promise, to decentralize part of the public service. He intends to do so by relocating close to 700 full-time employment positions to smaller communities, if the forces opposed to this decision can be overcome.

The *second* "noteworthy aspect" of the Neepawa meeting relates to a long-term benefit that resulted from this conference in the form of research conducted by WESTARC. Many of those who attended completed a questionnaire, the results of which were tabulated. It is interesting to see how those rural residents rated their three major concerns:

- They want more and better *education*, and this means education in its broadest sense, not merely K-12, but also trade training, re-entry training, distance education, and extension courses from universities and community colleges.
- They fear that the continuing centralization of public services will rob them of the *health facilities*. Because of the unusually high percentages of town and village residents who are seniors, the matter of health is a critical factor in the rural parts of the Province.
- They want a guarantee of *continuity of income*.

Our second sign of change is a new attitude that we feel that we can sense among rural dwellers.

A new attitude.

Observers of rural Manitoba have a special interest in a quotation attributed to Howell: "the vast majority of communities have within themselves and within their grasp a considerable capacity to develop. It is attitude that ultimately makes a difference."[32] There *is* a changing attitude in rural Manitoba. It is possible to cite town-watchers who believe this became manifest at the turn of the decade.

It is not necessary to write a Ph.D. dissertation to prove that many rural residents are resistant to change. While they all swear that they want progress, they are not interested in paying the price when that price is change.

For years, townsfolk have been silently praying that some senior level of government, or some benevolent corporation (if such a thing exists), would solve their problems with a new policy, or in the case of the corporation, a new payroll.

Only within recent months have they come to realize that salvation is found only in their own hearts, and in the collective heart of the community. What finally made the difference was the realization

that national policies are designed to help the major cities, and because of this, they are directly harmful to smaller centres.

Most enlightened rural residents are capable of reciting a list of benefactions which have been showered upon Winnipeg, for example, for which there are no matching rural favours.

Urban renewal has soaked up millions of tax dollars. The Forks is being developed largely for the benefit of the capital city. Virtually every major facility, from the virology laboratory to the Sustainable Development Institute to the enlarged taxation centre is being located in Winnipeg. The rural argument against such concentration is not unpersuasive.

No less a planner than Lewis Mumford viewed 300,000 as the optimum size for a city, following which "moral decay" sets in. Rural residents believe that good planning calls for a policy to develop Selkirk, or Morden, or Portage la Prairie, or Brandon as larger satellites of Winnipeg, thus taking the pressure off Winnipeg's need for costly extensions of its utilities.

Rural residents have observed the constant decay of vital services. When rural postmasters retire, postal policy frequently dictates that no replacement be hired, as a reduced service is located in a retail store.

Rail-line abandonment and agricultural restructuring have resulted in the loss of close to half the country elevators in the last ten years. The cancellation of the century-old postal subsidy for newspapers and magazines has meant that since March 1990, some rural residents have had to pay up to three times the subscription rates paid by residents of Winnipeg.

Our third sign, however, is one of hope.

Signs of hope.

Despite their grievances, rural residents are learning how to improve their communities. Today, the majority of the towns of 1,000 population or more, and some smaller ones, have active improvement programmes under way.[33]

Russell (1,777), Melita (1,416) and Shoal Lake (811) are communities working in co-operation with WESTARC on a pilot project called the Community Improvement Program. In this instance, WESTARC works in affiliation with the Canada Employment and Immigration Commission and Manitoba Rural Development.

At Manitou (855), a farm home-maker, Karen Wiebe, is the first president of an active home-business association which is doing education work with other rural home-makers who need some extra income, but who, for family reasons, are unable to leave the home for outside employment.

In the Minnedosa district there is an interesting example of a rural "cluster," in which one town, one village, and four rural municipalities co-operate for the provision of services which are jointly owned and operated. These include ambulance, planning, and sports organizations and facilities.

In Steinbach (9,011) there is a splendid example of the pooling of local resources. The agency responsible for this is the local credit union, which, in December 1989, distributed its annual interest payments of over $25 *million*. Many of the local social facilities, such as personal care homes, have been financed by this credit union.

In Deloraine (1,155) and Melita (1,416), for the first time in a century, there is public acknowledgement by community leaders that these towns will improve their chances of survival by working together rather than by competing.

Unknown to most Winnipeggers is a federally funded, but locally controlled programme called Community Futures. In the southwest corner of the Province, through an office located in Brandon, Community Futures and its companion the Venture Corporation, have, in just over three years, provided direct assistance in the formation of 53 newly-incorporated firms with a combined payroll of 172. Most of this job creation has been in towns *outside* of Brandon.

Finally, we can note some supporting sources of strength.

Sources of strength.

Working for the economic improvement of rural Manitoba are a number of agencies and associations with diverse and influential memberships. These include:

- Manitoba Rural Development
- Manitoba Community Newspapers Association
- Manitoba Women's Institute
- Manitoba Association of Municipal Administrators
- Manitoba Chambers of Commerce

Led by the Community Newspapers Association, there is a campaign under way to have these bodies co-operate in a so-called Rural Coalition, the function of which will be to promote rural Manitoba. Such an organization might go a long way towards negating David Douglas's "nexus of vulnerabilities."

NOTES

1. Lester R. Brown, Christopher Flavin and Sandra Postel, "Picturing a Sustainable Society," in *State of the World 1990: A Worldwatch Institute Report on Progress Toward a Sustainable Society* (New York: W.W. Norton and Company, 1990). A good Canadian summary on the topic is Nigel Richardson, *Land Use Planning and Sustainable Development in Canada* (Ottawa: Canadian Environmental Advisory Council, 1989). See also William E. Rees, "Defining 'Sustainable Development,'" University of British Columbia, Centre for Human Settlements, *Research Bulletin* (May 1989).

2. For instance, the publications of the Sustainable Development Branch of Environment Canada are, almost without exception, concerned with "resources" and "land use." E.g., *Sustainable Development Publications and Background Materials List* (Environment Canada, Conservation Strategies and Development Division: Sustainable Development/SOE Branch, October 1989); *Issues in Environmentally Sustainable Development: Resources and Jobs: The Vital Connection*, Fact Sheet 89-1 (Environment Canada: Sustainable Development Branch, July 1989); *Urbanization and the Sustainability of Canada's Prime Capability Agricultural Land* (Environment Canada: Sustainable Development Branch, n.d.). The avowed mandate of the federal Department of the Environment "is to protect the life-support systems on which Canadians depend: clean air, fresh water, healthy soil." The communities in which people live are not within this mandate. See *Into the Mainstream: Strategies for a Secure Environment* (Ottawa: Environment Canada, 1988).

3. "Rural Communities" was the subject of a recent conference of the Canadian Agricultural and Rural Restructuring Group (ARRG) (First Rural Policy Seminar, Saskatoon, October 1989). Parts of this paper are based upon materials presented at this conference.

4. "The Definition of Sustainable Development" (Environment Canada, Sustainable Development Branch, Canadian Wildlife Service, Conservation and Protection, February 1989).

5. This model and some of the arguments put forward in this paper are loosely based upon material gleaned from Wendy L. Simpson-Lewis and Edward W. Manning, "Food For Thought: Can We Preserve Our Agricultural Land Resource?", *Alternatives* (Journal of Friends of the Earth, Canada), 20,1 (Spring/Summer 1981).

6. J.C. Everitt and Alison Gill, "The Social Geography of the Small Canadian Town," in D. Ley and L. Bourne, eds., *The Social Geography of Canadian Cities* (McGill-Queen's University Press, forthcoming). Tony Fuller, Philip Ehrensaft and Michael Gertler, "Sustainable Rural Communities in Canada: A Discussion Paper," presented to the First Rural Policy Seminar, Saskatoon, October 1989.

7. Everitt and Gill, forthcoming.

8. Everitt and Gill, forthcoming; John E. Carlson, Marie L. Lassey and William R. Lassey, *Rural Society and Environment in America* (New York: McGraw Hill, 1989), chap. 4.

9. *Webster's New Collegiate Dictionary* (Toronto: Thomas Allen and Son, 1973), p. 392.

10. Fuller et al., "Sustainable Rural Communities," p. 23.

11. Everitt and Gill, forthcoming; Carlson et al., *Rural Society and Environment.*

12. Marcia D. Lowe, "The Bicycle: Vehicle for a Small Planet," *Worldwatch Paper 90* (Washington, DC: Worldwatch Institute, September 1989).

13. Brown et al., "Picturing a Sustainable Society."

14. A similar argument can be made for the ecological world. See Jim McNeill, "Strategies for Sustainable Economic Development," *Scientific American* (September 1989): 155-65.

15. A similar dilemma is, of course present when looking at other elements of sustainability. For instance, see Edward W. Manning, "Prophets and Profits: A Critique of Benefit/Cost Analysis for Nature Resource Decisions," *Alternatives*, 15,1 (1987): 36-41; and M.A. Kerr, N. Lavigne and W. Simpson-Lewis, *Environment-Economy Integration: Introducing the Concept* (Ottawa: Environment Canada, 1987).

16. Fuller et al., "Sustainable Rural Communities," section 2.

17. David J.A. Douglas, "Sustainable Rural Communities: Notes from Experience," discussion paper presented at the First AARG Rural Policy Seminar, Saskatoon, October 11-13, 1989. See also idem, "Community Economic Development in Rural Canada: A Critical Overview," *Plan Canada*, 29:2 (1989): 28-46.

18. Douglas, "Sustainable Rural Communities," pp. 6-7.

19. Ibid., p. 10.

20. Ibid., p. 9.

21. Fuller et al., "Sustainable Rural Communities," p. 21.

22. There is no Federal Department of Rural Development, and such Departments have only recently been instituted in Manitoba (1989) and Saskatchewan. Federally, inter-departmental committees have only recently been struck with a mandate to pay attention to rural concerns. Rural development ministers from the Western provinces have just started to co-ordinate an approach to the revitalization of rural communities (*Winnipeg Free Press*, 11 April 1990, p. 13).

23. This is also the case for other aspects of the Canadian environment. See, for instance, Edward W. Manning, "Soil Conservation: The Barriers to Comprehensive National Response," *Prairie Forum*, 13, 1 (1988): 99-121; idem, "Planning Canada's Resource Base for Sustainable Production," in I. Knell and J. English, eds., *Canadian Agriculture in a*

Global Context: Opportunities and Obligations (Waterloo: University of Waterloo, Centre on Foreign Policy and Federalism, 1986), pp. 53-68.

24. John S. Brierley and Daniel Todd, *Prairie Small-Town Survival: The Challenge of Agro-Manitoba* (Lampeter: Edwin Mellen Press, 1990).

25. James M. Howell, "Economic Development of the Future: Myths and Realities," in *Proceedings of the Community Economic Development Strategies Conference* (Ames, IA: North Central Regional Center for Rural Development, Iowa State University, 1983), pp. 23-24.

26. Our comments in this section are based in part upon our own research, and in part upon Fuller et al., "Sustainable Rural Communities" and Ray Bollman, "Sustainable Rural Communities: Some Elements for Success," in R. Rounds, ed., *Proceedings of the Prairie Forum on Rural Development* (Brandon, MB: Rural Development Institute, Brandon University, 1990).

27. Once again, similar arguments have been made for the conservation of Canada's resource base. See, for instance, Edward W. Manning, "Conservation Strategies: Providing the Vision for Sustainable Development," offprint; and William D. Ruckelshaus, "Toward a Sustainable World," *Scientific American* (September 1989): 166-74.

28. This comment was made with reference to "ecological imperatives," but applies as well to the sustainability of rural communities. See Ruckelshaus, "Sustainable World."

29. Mark L. Seasons, "Economic Development in Small Communities: Current Practice and Future Approaches," in Floyd W. Dykeman, ed., *Integrated Rural Planning and Development* (Sackville, NB: Rural and Small Town Research and Studies Programme, 1988).

30. The quotation is taken from an article on sustainable agriculture, but it applies equally well to sustainable rural communities. See Pierre R. Crosson and Norman J. Rosenberg, "Strategies for Agriculture," *Scientific American* (September 1989): 128-35.

31. See, e.g., *Strategic Planning for Rural Development* (Brandon: WESTARC Group Inc., 1989); and *Prairie People: Changes and Challenges* (Brandon: WESTARC Group inc., 1989).

32. Howell, "Economic Development," pp. 23-24.

33. Fred McGuinness, *Bootstrap Two: Stories of Rural Manitoba Entrepreneurs* (Winnipeg: Manitoba Department of Rural Development, 1989).